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Superfund Record of Decision (EPA Region 1): Baird and McGuire Holbrook, Massachusetts (Third Remedial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

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16. Abstract (Limit: 200 words)

The Baird & McGuire site is a former chemical manufacturing facility in northwest Holbrook, Massachusetts, approximately 14 miles south of Boston. The 20-acre site is situated in a wetland area within the 100-year floodplain of the Cochato River which lies to the east. From 1912 to 1983 the company operated a chemical manufacturing and batching facility on the property. Manufactured products included herbicides, pesticides, disinfectants, soaps, floor waxes and solvents. Waste disposal methods at the site included direct discharge into the soil, nearby brook and wetlands, and a former gravel pi (now covered) in the eastern portion of the site. Underground disposal systems were also used. The South Street wellfield, part of the municipal water supply for Holbrook, is within 1,500 feet of the Baird & McGuire property. The last operating well was shut down in 1982 due to organic contamination which possibly originating from the site. EPA conducted a removal action at the site in 1983 after a waste lagoon overflowed spreading contaminants into the Cochato River. The company ceased operating shortly thereafter. A second removal action was conducted in 1985, following the discovery of dioxin in site soils. EPA also conducted an Initial Remedial Measure at the site from 1985 through 1987 which involved constructing a new water main to direct water away from the site, removing building structures, and installing a temporary cap. In 1986 a Record of Decision (ROD) was signed to address onsite ground water treatment and incineration of contaminated soil. This ROD addresses the Cochato River sediment contamination. (Continued on next page)

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17. Document Analysis a. Descriptors
Record of Decision - Baird & McGuire, MA
Third Remedial Action
Contaminated Media: sediment
Key Contaminants: organics, (PAHs, pesticides), metals (arsenic)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

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16. Abstract (Continued)

EPA/ROD/R01-89/037
Baird & McGuire, MA

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The primary contaminants of concern affecting the sediment are organics including PAHs and pesticides, and metals including arsenic.

The selected remedial action for this site includes all placement of river silt curtains downstream of the site; excavation and onsite incineration of approximately 1,500 cubic yards of contaminated sediment; backfilling excavated areas with clean fill and onsite placement of treated sediment; restoration of wetland areas; and long term surface water and sediment monitoring. The estimated present worth cost for this remedial action is $1,656,000, which includes an estimated annual O&M cost of $22,000.

PB90-149774

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R01-89/037
September 1989

EPA

Superfund Record of Decision:

Baird & McGuire, MA

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SPRINGFIELD, VA. 22161

RECORD OF DECISION SUMMARY

BAIRD & McGUIRE SITE/ SEDIMENT STUDY AREA

HOLBROOK, MASSACHUSETTS

SEPTEMBER 14, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION I

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

Site Name and Location

Baird & McGuire Site/Sediment Study Area
Holbrook, Massachusetts

Statement of Purpose

This Decision Document presents the selected remedial action for this Site developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Contingency Plan (NCP), 40 CFR Part 300 et seq., 50 Federal Register 47912 (November 20, 1985).

The Commonwealth of Massachusetts has concurred with the selected remedy.

Statement of Basis

This decision is based on the Administrative Record which was developed in accordance with Section 113(k) of CERCLA and which is available for public review at the information repositories located at the Holbrook Public Library in Holbrook, Massachusetts, and at the EPA offices at 90 Canal Street in Boston, Massachusetts. The attached index identifies the items which comprise the Administrative Record upon which the selection of a remedial action is based.

Description of the Selected Remedy

The selected remedial action for the Baird & McGuire Site/Sediment Study Area consists of source control measures.

The source control remedial measures include:

- Excavation and incineration of approximately 1,500 cubic yards of contaminated sediments for protection of public health and the environment in this area. Sediments in the Cochato River will be mechanically excavated to an average depth of six (6) inches, from approximately the center of the fenced Site area downstream to Union Street.

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- Excavated sediments will be placed in specially designed containers and trucked to the on-Site treatment facility. The sediments will be treated utilizing a transportable incinerator that will be brought on-Site for the soil excavation and incineration phase of overall Site remediation.

- The treated sediments will be placed on-Site as backfill material, along with other treated Site soils. EPA is currently conducting tests on Site soils at an off-site EPA research facility. These tests are designed to verify the effectiveness of the incineration process on contaminated soil from the Baird & McGuire Site, and to characterize the wastes streams that will be generated by the incineration process. This testing will include verification of the suitability of the material as backfill for the Site, and will include a determination of whether the material is subject to the Land Disposal Restrictions under the Resource Conservation and Recovery Act (RCRA).

Additional measures include:

- Utilization of silt curtains in the river to minimize the possibility of suspended sediments being transported downstream during excavation. Remedial design will address the details of the silt curtains and will examine any other type of controls that may be appropriate during construction.

- Restoration of wetland areas adversely impacted by the remedial action, such as those impacted by excavation access road construction.

- Placement of clean backfill in excavated areas of the river immediately in the vicinity of the groundwater plume discharge to the river.

- Long term monitoring of downstream portions of the Cochato River that will not have sediments excavated.

The estimated present worth cost for the selected remedy is $1,656,000. This estimate includes capital costs, as well as long term monitoring of the downstream areas.

Declaration

The selected remedy is protective of human health and the environment. The remedy satisfies the statutory preference for treatment that permanently and significantly reduces the volume, toxicity and mobility of the hazardous substances, pollutants and contaminants as a principal element. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and is cost-effective. The selected remedy also attains all federal and state requirements that are applicable or relevant and appropriate (ARARs).

Sept 14, 1989
Date

Paul G. Keough
Paul G. Keough
Acting Regional Administrator, EPA Region I

BAIRD & MCGUIRE SITE
SEDIMENT STUDY AREA

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BAIRD & McGUIRE SITE
SEDIMENT STUDY AREA

Record of Decision Summary

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ROD DECISION SUMMARY
BAIRD & McGUIRE SITE/SEDIMENT STUDY AREA

I. SITE NAME, LOCATION AND DESCRIPTION

The Baird & McGuire Site is located on South Street in northwest Holbrook, Massachusetts, approximately 14 miles south of Boston. The twenty-acre Site is bounded by South Street to the south and west, Mear Road to the north, and the Cochato River to the east. Approximately 2.5 miles downstream from the Site, the Cochato River flows past a sluice gate regulating the diversion of river water to the Richardi Reservoir, a water supply source for the towns of Holbrook, Randolph, and Braintree. This diversion has been closed since 1983.

Eight of the twenty acres have been owned by the Baird & McGuire Company since 1912, when chemical manufacturing operations began. The Baird & McGuire property originally included a laboratory, storage and mixing buildings, an office building and a tank farm.

For over 70 years, Baird & McGuire, Inc. operated a chemical manufacturing and batching facility on the property. Later activities included mixing, packaging, storing and distributing various products, including herbicides, pesticides, disinfectants, soaps, floor waxes and solvents. Some of the raw materials used at the Site were stored in the tank farm and piped to the laboratory or mixing buildings. Other raw materials were stored in drums on-Site. Waste disposal methods at the Site included direct discharge into the soil, nearby brook and wetlands, and a former gravel pit (now covered) in the eastern portion of the Site. Underground disposal systems were also used to dispose of wastes.

The South Street wellfield, part of the municipal water supply for Holbrook, is within 1,500 feet of the Baird & McGuire property. The last operating well was shut down in 1982 due to organic contamination. Studies indicate that contaminants used or stored at the Site were possible sources of contamination in the well. In December 1982, the Baird & McGuire Site was placed on EPA's Proposed National Priorities List (NPL).

The Baird & McGuire Site/Cochato River Sediment Study Area extends from Lake Holbrook north to the Richardi Reservoir. This study area covers approximately a three-mile portion of the Cochato River and several tributaries, encompassing areas both upgradient and downgradient of the 20-acre Site. See Figure 1 for a map of the study area.

A more complete description of the Site can be found in the Focused Feasibility Study at pages 1-2 through 1-5.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Response History

In 1983, EPA conducted a removal action at the Site after a waste lagoon overflowed near the Cochato River and spread contaminants into the river. Emergency activities included removing approximately 1,000 cubic yards of heavily contaminated soils, construction of a groundwater interception/recirculation system to limit contaminated groundwater from migrating into the river, and regrading the contaminated waste disposal area and covering it with a temporary clay cap. In response to the lagoon overflow, the Tri-Town Water Board (Holbrook, Randolph, Braintree) closed the sluice gate approximately 2.5 miles downstream from the Site that diverted water to the Richardi Reservoir. To date, the sluice gate has remained closed.

A second removal action for the Site was initiated in 1985 following the discovery of dioxin in Site soils. EPA conducted additional sampling of air, soils and water, and an additional 5,600 feet of fence was installed at that time.

Another major activity conducted at the Site by EPA in 1985 through 1987 was an Initial Remedial Measure (IRM). A new water main was constructed along South Street to replace an existing main that passed through the Baird & McGuire Site, and the water main passing through the Site was abandoned by filling it with concrete. The Baird & McGuire laboratory and mixing buildings and tank farm were demolished and removed as part of the IRM, and a temporary synthetic cap was installed over that portion of the Site. Wood from the demolished buildings was shredded and placed into barrels and crates that are currently stored on-Site in the storage building.

A Record of Decision for the Site, signed in 1986, divided the cleanup of the Baird & McGuire Site into operable units. An operable unit is a discrete part of an entire response action that decreases a release, a threat of a release, or a pathway of exposure. EPA determined in the 1986 ROD that operable units are appropriate for the overall remediation of the Baird & McGuire Site. The 1986 ROD established two major remedial components: extraction and on-Site treatment of groundwater (operable unit #1); and, on-Site excavation and incineration of contaminated soil, much of which is currently covered by temporary caps (operable unit #2). In addition, the demolition material remaining from the original Baird & McGuire buildings will be incinerated on-Site when the soil incineration portion of the long-term remedial action program is initiated.

EPA and the U.S. Army Corps of Engineers have completed the design of the on-Site groundwater extraction/treatment/recharge system, and the U.S. Army Corps of Engineers is currently preparing to award this construction contract. Design of the incineration system is currently underway, as is a series of tests to determine the operating procedures that will most effectively destroy soil contaminants. The soil incineration tests are being conducted off-site at EPA's Office of Research and Development facility in Arkansas.

This Record of Decision is for the third operable unit for the Baird & McGuire Site, which addresses Cochato River sediment contamination. A fourth operable unit, addressing a potential alternate water supply for the town of Holbrook, is currently underway, and a Proposed Plan for this fourth operable unit is scheduled for release to the public in 1990.

A more detailed description of the Site history can be found in the Focused Feasibility Study at pages 1-5 through 1-6.

B. Enforcement History

The Baird & McGuire facility had a lengthy history of violating environmental laws. From the mid-1950's on, the company received numerous citations for violations of the Federal Insecticide, Fungicide, and Rodenticide Act. Further, both the state and the local governments took legal actions against the company at various times.

EPA involvement under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) began in March 1983 with the first removal action conducted at the Site. Baird & McGuire, Inc. ceased operating shortly thereafter, and the company and its officers took the position that they did not have sufficient assets to pay for the (remedial) work necessary at the Site.

In October 1983, the United States of America, on behalf of the Administrator of EPA, filed a cost recovery action under Sections 104(a) and (b) and 107(a) of CERCLA. The complaint sought reimbursement for costs incurred by the United States in remedying Site conditions from Baird & McGuire, Inc., Baird Realty Co., Inc. (subsequently know as the Ann E. Realty Trust, Inc.), Cameron M. Baird, and Gordon M. Baird.

Baird & McGuire, Inc. owned and operated the Baird & McGuire facility. Baird Realty Co., Inc. was a record owner of part of the Site. Cameron Baird was the president, treasurer, and chief executive of Baird & McGuire, Inc. Gordon M. Baird (Cameron's brother) was the chairman of the board of Baird & McGuire, Inc..

The government contends that both individuals exercised control over the company's conduct, activities and operations.

The defendants to the lawsuit, as listed above, are also the only Potentially Responsible Parties ("PRPs") identified to date by EPA.

The PRPs maintained from early on in discussions with EPA both that they lacked the financial assets to conduct the remedy and that they were not liable. The PRPs provided some information regarding their finances, and the United States obtained a lien on a parcel of property owned by the Ann E. Realty Trust, Inc.. EPA subsequently determined that the PRPs were unable and unwilling to implement the full remedy at the Site.

The cost recovery action filed in 1983 was settled on an "ability to pay" basis in 1987. The Consent Decree that was signed by all parties in September 1987 includes the following major provisions:

- A cash payment of $900,000, made in two installments;
- Full access to the Site for the purposes of implementing response actions;
- Liens on the Baird & McGuire property, which consists of 2 lots owned by the Ann E. Realty Trust and the Baird & McGuire lot; and
- Rights to insurance policies which may provide coverage for costs incurred in response to the release or threat of release of hazardous substances from the Baird & McGuire property.

EPA is continuing negotiations with the insurers of Baird & McGuire, Inc.. No settlements have yet been reached with these parties.

The PRPs have had virtually no involvement in the FFS and remedy selection process for this operable unit. EPA notified the public, including the PRPs, of the issuance of the Proposed Plan, but received no PRP comments on the Proposed Plan.

Special notice has not been issued in this case for the earlier operable units since the cost recovery case, filed in 1983, was settled with the PRPs in 1987.

III. COMMUNITY RELATIONS

Throughout the Site's history, community concern and involvement has been high. EPA has kept the community and other interested parties apprised of the Site activities through Baird & McGuire Task Force meetings, informational meetings, fact sheets, press releases and public meetings.

In 1985, EPA released a community relations plan, which has been periodically updated, which outlines a program to address community concerns and keep citizens informed about and involved in activities during remedial activities. Throughout 1985 and 1986, EPA held a series of public informational meetings to describe the plans for and results of the Remedial Investigation, Feasibility Study, and other actions taken by the Agency at the Site during this time.

In May 1989, EPA made the administrative record available for public review at EPA's offices in Boston and at the Holbrook Public Library. The administrative record was subsequently updated in June 1989 to include additional documents used by the Agency for this Cochato River Sediment Study decision. EPA published a notice and a brief analysis of the Proposed Plan in The Patriot Ledger on June 12, 1989 and made the Plan available to the public at the Holbrook Public Library.

For the Baird & McGuire Cochato River Sediment Study, EPA held an informational meeting on June 13, 1989 to discuss the results of the Focused Feasibility Study and the cleanup alternatives included in this Focused Feasibility Study and to present the Agency's Proposed Plan. During this meeting, which was held at the Holbrook Jr. Sr. High School, the Agency also answered questions from the public. From June 19, 1989 through July 19, 1989, the Agency held a thirty-day public comment period to accept public comment on the alternatives presented in the Focused Feasibility Study and the Proposed Plan and on any other documents previously released to the public or included in the administrative record. On July 12, 1989, the Agency held a public meeting to accept any oral comments. A transcript of this meeting and the comments and the Agency's response to comments are included in the attached Responsiveness Summary.

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

As anticipated in the "Future Action" section of the 1986 ROD for the Site, this operable unit addresses sediment contamination in the Cochato River attributable to the Baird & McGuire Site.

The Focused Feasibility Study for the Cochato River Sediment Study Area focused on the nature and extent of sediment contamination, the associated risks, and an examination of potential remedial alternatives. This ROD, and its incorporated Figures, Tables, and Appendices, calls for excavation of contaminated Cochato River sediments and treatment by the same technology that was selected for the other contaminated Site soils in the 1986 ROD.

V. SITE CHARACTERISTICS

Chapter 1 of the FFS contains an overview of the Remedial Investigation (RI). The significant findings of the RI are summarized below.

A. Hydrogeologic Setting and Contaminant Migration

1. Baird & McGuire Site

The geologic features of the Baird & McGuire Site area are representative of processes associated with glaciation. The observed features are bedrock, till, outwash deposits of stratified sands, gravel and silts, organic soils and fill materials.

The bedrock underlying the Site is fractured and shows indications, through monitoring well and rock core observations, of groundwater movement through the fractures. In general, the top of competent bedrock appears to slope downward from South Street toward a closed depression or bowl in the low lying eastern portion of the Site. A bedrock valley extends northwestward from this bowl.

The soils overlying bedrock consist of 3 general types, although a pump test conducted at the Site indicates the overburden generally responds as one unit.

Soil Type	Approximate Hydraulic Conductivity (ft/day)
silty sands, sand, and silt	3
medium and coarse sands	45
glacial till	10

2. Contaminant Migration

Man-made barriers are currently used to minimize the migration of contamination from the Site. The barriers are the groundwater interception/recirculation system and the temporary clay cap installed in 1984 as a part of the first removal action, and the temporary high density polyethylene (HDPE) cap installed in 1987 as a part of the IRM. The temporary impervious capping was designed to divert clean runoff and precipitation away from the Site and to limit direct infiltration. It also reduces the potential for direct contact with contaminated soils.

Contaminated substances have migrated and continue to migrate from the Baird & McGuire property through groundwater and surface water routes. Groundwater discharges into the Cochato River. However, according to the original RI/FS conducted for the 1986 ROD, this contamination is being effectively attenuated by organic soils and sediments on the river bottom, biodegraded by anaerobic and aerobic bacteria, and diluted by surface water so as to prevent any measurable degradation of water in the Cochato River.

Migration of contamination through surface water is primarily via stormwater runoff. Uncapped contaminated soils have in the past eroded, and continue to do so, and are transported during storm events. The wetlands surrounding the Site show the greatest evidence of contaminated particulate transport via surface water. Sediment contamination of the Cochato River and the unnamed brook near the Site and downstream from the Site can be attributed to Baird & McGuire surface water runoff.

B. Cochato River

1. Sediment

Based on the results of December 1987 screening, 84 sediment samples were collected from 44 locations throughout the Cochato River Sediment study area during June 1988. Samples were collected from three depth increments: 0 to 6 inches; 12 to 18 inches; and 18 to 36 inches. All 84 samples were analyzed for target compound list (TCL) inorganics and organics, and herbicides. Twenty-seven of the 84 samples were also analyzed for physical characteristics, including grain size, moisture content, total volatile solids, specific gravity, and pH.

The predominant contaminants detected in the sediment during June 1988 sampling event were VOCs, arsenic, base/neutral organic compounds, and pesticides. Based on environmental concentrations and toxicological properties of these contaminants, four

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chemicals or chemical groups were selected as contaminants of concern: arsenic, PAHs, DDT and metabolites (including DDD and DDE), and chlordane.

The maximum concentrations of Site-related contaminants in sediments are presently located within 500 feet downstream of the current Site fence. Elevated concentrations of arsenic, base/neutral organic compounds, and pesticides are also found in the Ice Pond and in a swampy area (Mary Lee Wetlands) approximately 1,200 feet downstream from the Ice Pond. The occurrence of these elevated concentrations downstream implies that the distribution of the contaminants is controlled, at least in part, by sediment transport and deposition of sediment-bound contaminants in areas of low velocity. Concentrations of Site-related contaminants in sediments decrease appreciably downstream from the Ice Pond and remain at relatively low levels throughout the large wetland downstream to the Braintree Golf Course. Many of the base/neutral extractable organic compounds detected in on-Site sediments were also detected in sediments of the major tributaries to the Cochato River. This finding indicates that other sources of these contaminants exist within the Cochato River watershed.

Concentrations of contaminants in sediment were generally highest in the surface samples and decreased with increasing depth. This finding indicates that sediment transport is the predominant mechanism for contaminant transport. An additional explanation of the decrease in contaminant concentration with depth may be that total organic carbon (TOC) content generally decreases with depth. Chlordane was an exception to the general trend in that the maximum concentration of chlordane was detected in the 12 - 18 inch depth interval and not in the surficial sample. The higher volatility and solubility of chlordane relative to DDT may account, in part, for the increased concentration at depth. The higher chlordane concentration at depth may also have resulted from episodic storm deposition of chlordane-contaminated sediment and may be related to the time, location, and method of disposal at the Baird & McGuire property. Relatively high base/neutral concentrations were detected in the 12 - 18 inch depth interval, located within the base/neutral groundwater plume.

2. Surface Water

Surface water samples were collected from the Cochato River at seven locations upstream and downstream from the Baird & McGuire property. For each location, unfiltered surface water was analyzed for TCL organics and metals, and nine general water quality parameters. Filtered surface water samples from each location were analyzed for TCL semi-volatile organics, pesticides, and metals.

Arsenic was not detected in any of the surface water samples. No organic compounds were detected in any of the surface water samples, with the exception of one low phthalate concentration present in one filtered surface water sample. This phthalate is believed to have been introduced during filtering of the sample.

The lack of contamination detected in surface water at non-storm flows is probably related to the low total suspended solids concentration of the surface water at those flows (less than 10 milligrams per liter (mg/l or parts per million).

3. Groundwater

Nine groundwater samples were collected from existing seepage meters and wells adjacent to the Cochato River to obtain an understanding of groundwater contaminant loadings to the river.

The groundwater plume identified in the Phase I and II RIs (for the 1986 ROD) continues to serve as a source of inorganic and organic contamination from the Baird & McGuire property to the Cochato River. Arsenic (up to 3,090 micrograms per liter (ug/l or parts per billion), VOCs (up to 6,200 ug/l), base/neutral organic compounds (up to 8,245 ug/l), and pesticides (up to 56 ug/l) were detected in various groundwater samples. Estimated maximum groundwater discharge from the contaminant plume to the Cochato River is about 0.03 cubic feet per second (cfs), and probably represents less than one percent of the average river flow. Any groundwater contaminants entering the river undergo significant dilution.

A complete discussion of Site characteristics can be found in the Focused Feasibility Study at pages 1-7 through 1-17.

VI. SUMMARY OF SITE RISKS

A Risk Assessment (RA) was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site. Four (4) contaminants of concern, listed in Table 1, were selected for evaluation in the RA. These contaminants constitute a representative subset of the contaminants identified in the sediments during the FFS that represent the majority of the risk to public health and the environment. The four contaminants were selected to represent potential on-Site hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment.

All 102 contaminants originally evaluated in the baseline Risk Assessment conducted for the Site were re-evaluated during the selection of contaminants of concern for the Cochato River FFS. Levels of arsenic, DDT, chlordane, and carcinogenic PAHs at the Site were associated with elevated carcinogenic public health risks. Noncarcinogenic compounds were also detected at the Site, but below concentrations considered to present a public health risk. Selected noncarcinogenic compounds, such as lead, were quantitatively evaluated during the selection of the contaminants of concern. Examination of historical data, in addition to the sampling undertaken as a part of the FFS, did not indicate the presence of noncarcinogenic compounds in excess of appropriate health-based criteria. Therefore, noncarcinogenic effects were not evaluated further in the RA.

Potential human health effects associated with the contaminants of concern in sediments were estimated quantitatively through the development of hypothetical exposure scenarios. Incremental lifetime cancer risks and a measure of the potential for noncarcinogenic adverse health effects were estimated for the various exposure scenarios. Conservative exposure scenarios were developed to reflect the potential for exposure to hazardous substances based on the characteristic uses and location of the Site. A factor of note that is reflected in the public health RA is the assumption that a child would come in contact with the contaminated sediments 30 times per year over a 10-year exposure duration. For the ecological risk assessment, benthic sampling was included in a biological survey that was conducted as a part of the FFS.

The RA conducted as a part of this FFS is a supplement to the baseline RA conducted for the Site as a part of the 1986 ROD. The original baseline RA considered exposure to: groundwater; muck (Cochato River sediment); fish; surface water via drinking and swimming; and dry soils.

A. Public Health Risk Assessment

The FFS study area differs from the original Site study area. The FFS study area extends upstream and downstream of the Baird & McGuire property, and it is limited to Cochato River surface water and sediment. Further, only the 4 contaminants of concern (arsenic, PAHs, DDT and metabolites, and chlordane) were examined under this RA. Since surface water sampling did not identify any detectable concentrations of contaminants, exposure to surface water was not evaluated in the RA. Only risks associated with direct contact exposure to sediments were evaluated.

Cumulative risk estimates range between 3 x 10^{-5} and 5 x 10^{-6} and are associated with direct contact exposure to sediments. These risk estimates fall within EPA's target risk range, and slightly exceed the Massachusetts Contingency Plan (MCP) risk level of 1×10^{-5}. No significant risks are associated with exposure to surface water.

Refer to Table 1 for the Public Health Risk Summary. Further information regarding the public health risk assessment is in the Focused Feasibility Study at pages 1-18 through 1-24.

B. Ecological Risk Assessment

The original baseline RA did not include identification of aquatic invertebrate organisms in the Cochato River or its associated wetlands or lakes. The FFS included benthic sampling during a biological survey that was conducted during the study.

Interim Sediment Quality Criteria (SQC) are available for DDT and selected PAHs. Mean site-specific SQC were calculated and normalized to the organic carbon content (TOC).

Bioassays were performed with sediment and 4 species of aquatic test animals to determine the potential toxicity of the river sediment. Sediment in the vicinity of where the unnamed brook feeds into the Cochato River was found to be acutely toxic to aquatic fauna. Toxicity of sediment from this area to bioassay organisms is believed to be associated with DDT.

Based on the physical and chemical characteristics of the sediment, arsenic levels are not significantly bioavailable at most locations and appear to pose little long-term risk to the resident biota.

Based on the degree of exceedance of the SQC, chlordane poses the greatest risk for aquatic fauna in the Cochato River where it was detected. DDT is the most widespread contaminant of concern. The greatest exceedances of the respective SQC more often occur in the top layer of sediment, where exposure is most likely.

A complete discussion of the ecological Site risks can be found in the Focused Feasibility Study at pages 1-24 through 1-58.

VII. DOCUMENTATION OF SIGNIFICANT CHANGE

EPA adopted a proposed plan (preferred alternative) for remediation of the Site on June 12, 1989. The preferred alternative included the following major provisions:

- Excavation of approximately 1,200 cubic yards of contaminated sediments; and

- Treatment of the excavated sediments utilizing the on-Site incinerator.

The decision set forth in this document is similar to the proposed plan, with several minor changes and one significant change. The minor changes include the following items:

- The addition of a small area for excavation adjacent to the original area delineated for excavation, increasing the excavation volume by approximately 300 cubic yards, for a total of 1,500 cubic yards of sediments to be excavated;

- The addition of downstream monitoring during sediment excavation, the details of which will be addressed during remedial design; and

- The addition of backfilling (with clean organic material) that portion of the river bed in the vicinity of the groundwater plume discharge to the river.

The Agency has decided to include the excavation of the 300 cubic yards of sediment (from sample area SD-116) in the extent of excavation. Although the contaminant levels in this area do not exceed the public health target levels, the low level of organic carbon content (TOC) indicates that contaminants are not as likely to be bound to the sediment, and therefore are more likely to be available to organisms and pose an environmental risk. In addition, this area is contiguous with the area targeted for public health remediation, so the additional costs associated with this volume increase are relatively small.

The Agency does not consider the addition of approximately 300 cubic yards of sediment excavation and incineration to be a significant change. The total sediment volume to be excavated and treated for this operable unit (1,500 cubic yards) comprises approximately 1% of the volume of soil to be excavated and treated as a part of the overall Site remediation.

However, the addition of the long-term downstream monitoring is considered to be a significant change because it represents a modification of the proposed alternative. The addition of long-term monitoring of downstream portions of the Cochato River that will not have sediments excavated increases the overall remedy costs by approximately $338,000. This addition to the remedy is a logical outgrowth of the proposed source remedy, and it has been added in response to comments by the Department of Environmental Protection and other members of the public.

VIII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Prior to the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), actions taken in response to releases of hazardous substances were conducted in accordance with CERCLA, as enacted in 1980, and the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 (1988), promulgated in the Federal Register on November 20, 1985. Although EPA proposed revisions on December 21, 1988 to the NCP to reflect SARA, until those proposed revisions are finalized, the procedures and standards for responding to releases of hazardous substances, pollutants and contaminants shall be in accordance with Section 121 of CERCLA and to the maximum extent practicable, the current NCP.

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is granted; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a statutory preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous wastes over remedies that do not achieve such results through treatment. Response alternatives were developed to be consistent with these congressional mandates.

A number of potential exposure pathways were analyzed for risk and threats to public health and the environment in the Risk Assessment. Guidelines in the Superfund Public Health Evaluation Manual (EPA, 1986) regarding development of design goals and risk analyses for remedial alternatives were used to assist EPA in the development of response actions. As a result of these assessments, remedial response objectives were developed to mitigate existing and future threats to public health and the environment. These response objectives are:

- Reduce human exposure to arsenic, DDT, PAHs, and chlordane in sediment to concentrations corresponding to a 1×10^{-5} to 1×10^{-6} excess cancer risk level; and

- Reduce environmental exposure to the same 4 contaminants of concern to concentrations corresponding to the mean SQC in the river bed, and to the upper bound SQC in the wetland area north of Ice Pond.

Sediment Quality Criteria (SQC) are theoretically derived numerical standards for sediment contaminant concentrations that are considered to be protective of aquatic life and its uses. SQC, including mean and upper bound values, are explained in detail on pages 1-46 and 1-47 and in Appendix A of the FFS.

B. Technology and Alternative Development and Screening

CERCLA, the NCP, and EPA guidance documents including, "Guidance on Feasibility Studies Under CERCLA" dated June 1985, and the "Interim Guidance on Superfund Selection of Remedy" [EPA Office of Solid Waste and Emergency Response (OSWER)], Directive No. 9355.0-19 (December 24, 1986), and the Interim Final "Guidance for Conducting RIs and FSs under CERCLA," OSWER Directive No. 9355.3-01 (October 1988), set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements and guidance documents, a range of treatment alternatives, a containment option involving little or no treatment, and a no-action alternative where developed for the Site.

Section 121(b)(1) of CERCLA presents several factors that at a minimum EPA is required to consider in its assessment of alternatives. In addition to these factors and the other statutory directives of Section 121, the evaluation and selection process was guided by the EPA document "Additional Interim Guidance for FY '87 Records of Decision" dated July 24, 1987. This document provides direction on the consideration of SARA cleanup standards and sets forth nine factors that EPA should consider in its evaluation and selection of remedial actions. The nine factors are:

1. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs).
2. Long-term Effectiveness and Permanence.
3. Reduction of Toxicity, Mobility or Volume.
4. Short-term Effectiveness.
5. Implementability.
6. Community Acceptance.

7. State Acceptance.

8. Cost.

9. Overall Protection of Human Health and the Environment.

Chapter 4 of the Focused Feasibility Study identified, assessed and screened technologies based on screening criteria such as engineering feasibility, implementability, effectiveness, technical reliability, and cost. Refer to Table 2 for a technology screening summary, as well as an explanation of any site-limiting or waste-limiting characteristics.

These technologies were combined into alternatives. Chapter 5 in the Focused Feasibility Study presented the 14 remedial alternatives developed by combining the technologies identified in the previous screening process in the categories required by OSWER Directive No. 9355.0-19. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened in Chapter 6 of the Focused Feasibility Study. In summary, of the 14 remedial alternatives screened in Chapter 6, six (6) were retained for detailed analysis. Table 3 identifies the six (6) alternatives that were retained through the screening process, as well as those that were eliminated from further consideration. Figure 2 presents for each alternative the reasons why either the alternative was retained for detailed analysis or screened out.

IX. DESCRIPTION/SUMMARY OF THE DETAILED AND COMPARATIVE ANALYSIS OF ALTERNATIVES

This section presents a narrative summary and brief evaluation of each alternative according to the evaluation criteria described above. A detailed tabular assessment of each alternative can be found in Chapter 7 of the Focused Feasibility Study.

The alternatives analyzed for the Site include a no action alternative (NR-1); institutional action (NR-2); in-situ capping (NR-3); and three removal alternatives with varying levels of treatment (R-1, R-2, R-3).

To address the additional items that are discussed in Section VII of this ROD, the cost estimates for only the three removal alternatives have been revised upward to include these items. Although some of these additional costs (e.g., long term monitoring of downstream portions of the river) would be incurred by the public health remediation under Alternatives NR-2 and NR-3, these non-removal cost estimates have not been adjusted from the FFS estimates. Since cost-effectiveness is examined only among equally protective remedies, the revised costs for the three removal alternatives only are presented in Table 11.

The additional costs for public health remediation for the three removal alternatives include the following items:

- An additional 300 cubic yards of sediment for treatment and/or disposal and residuals management, for the total of 1,500 cubic yards;
- The addition of downstream monitoring during excavation;
- The addition of approximately 200 cubic yards of clean backfill material for that portion of the river bed in the vicinity of the groundwater plume discharge to the river; and
- The addition of long term monitoring of downstream portions of the Cochato River that will not have sediments excavated.

A. Non-Removal (NR) Alternatives

Alternative NR-1: No Action

Analysis of the No Action alternative is required by federal law and is included for comparison with other alternatives. In this alternative, no treatment of contaminated sediments would be conducted. In addition, no institutional controls would be implemented to reduce the potential for exposure to sediments. The possibility of further downstream contamination of sediments would remain. Because contaminants would remain, reviews of the Site would be required every five years to determine if risks to public health and the environment have changed.

The No Action alternative would not be protective of public health and the environment. No reductions in the toxicity, mobility, or volume of Site contaminants would be achieved.

Estimated Five-Year Review Costs: $28,000
Estimated Total Cost [Net Present Worth (NPW)]: $28,000

Alternative NR-2: Institutional Action

In this alternative, no treatment of contaminants would occur, but institutional controls would be implemented to restrict future Site use and development. These activities would include:

conducting a public education program to inform citizens of the risks associated with the Site; installing Site fencing and warning signs along the river where contact with sediments would pose a risk to public health; implementing deed and land restrictions; monitoring sediment and water quality yearly; and performing Site reviews every five years. The potential for further downstream movement of contaminated sediment would remain.

Alternative NR-2 would provide short- and long-term protection of public health by limiting direct contact with contaminated sediments, but would not be protective of the environment because contact with contaminated sediments by area biota would not be eliminated. This alternative would not meet EPA's cleanup goals; there would be no reduction of toxicity, mobility or volume of contaminants and ARARs would not be met.

Estimated Period of Operation: 30 years
Estimated Construction Cost: $88,000
Estimated Five-Year Review Cost: $56,000
Estimated Operation and Maintenance Costs (NPW): $484,000
Estimated Total Cost (NPW): $628,000

Alternative NR-3: In-Situ Containment

In this alternative, contaminated sediments in the Cochato River and adjacent wetlands would be covered in place (in-situ), with a multi-layer cap to prevent contact with contaminated sediments. The cap would be constructed of a permeable synthetic material covered with stones that would allow groundwater and surface water flow to pass though, but would prevent sediment movement and contact. Because the identified potential risks are different for public health than for the environment, EPA has identified a different level of response to address each potential risk. In order to protect public health, the cap would have to extend downstream from the Site to where the river is crossed by Union Street. To be protective of the environment, the cap would have to continue downstream to beyond the Mary Lee Wetlands. Both the Ice Pond and the Mary Lee Wetlands would be capped to address potential long-term environmental risk.

In implementing this alternative, vegetation would be removed for fifteen feet from each side of the river (and pond and wetland areas) to construct permanent roadways that would be required to allow placement and maintenance of the cap. An extensive wetlands replication program, which would be determined during the remedial design phase of the cleanup, would be included in this alternative to compensate for the extensive destruction of wetlands that would occur. This program would require extensive cooperation from local, state and Federal agencies.

Alternative NR-3 would not reduce the mobility, toxicity or volume of Site contaminants because no treatment would occur. This alternative would be effective in protecting public health and the environment over the short- and long-term, because contact with contaminants would be prevented. However, extensive destruction of wetlands and the river-bottom environment would result from the capping operation. Capping would not comply with EPA's preference for a permanent remedy. This alternative would require Site reviews every five years.

Estimated Time for Construction: 6 months
Estimated Period of Operation: 30 years
Estimated Construction Cost: Public health - $145,000
Environmental risk - $2,318,000
Estimated Five-Year Review Cost: $56,000
Estimated Operation and Maintenance Costs (NPW):
Public health - $560,000
Environmental risk - $870,000
Estimated Total Cost (NPW): Public health - $761,000
Environmental risk - $3,244,000

B. Removal (R) Alternatives

Three alternatives requiring excavation of contaminated Cochato River sediments were retained by EPA for final evaluation. Because the identified potential risks are different for public health than for the environment, EPA has identified a different level of response to address each potential risk, in a manner similar to that for Alternative NR-3 above. To protect public health, approximately 1,500 cubic yards of sediment would be excavated to a depth of 6 inches and treated. To address the risk to biota living in Cochato River, EPA would excavate sediments to different depths depending upon the area of the river and the depth at which the contaminants are found. Approximately 18,600 cubic yards of sediment would be excavated to address environmental risk, in addition to the 1,500 cubic yards that would be excavated to address public health. The cost estimates in this ROD for public health risks address 1,500 cubic yards of sediment; the estimates for environmental risks address the total volume of approximately 20,100 cubic yards of sediment.

A detailed explanation of the excavation activities common to all three removal alternatives is presented on pages 7-45 through 7-50 of the Focused Feasibility Study.

Alternative R-1: Removal and Off-Site Disposal

In this alternative, contaminated sediments would be excavated and transported off-site to a federally-approved hazardous waste landfill. The sediments would be dewatered prior to shipping, and the extracted water would be treated at the on-Site water treatment system to remove contaminants prior to discharge. Specially-designed trucks would be used to prevent the release of contaminated sediments during shipping.

This alternative would significantly reduce potential risks to public health and would address environmental risks. However, because there would be no treatment of contaminants, no reduction in toxicity, mobility or volume of the contaminants would result. Off-site disposal without treatment is considered a least favored action under the Superfund law. This alternative would be difficult to implement because of the limited landfill capacity available to dispose of hazardous waste.

Estimated Time for Construction: 6 months
Estimated Total Cost (NPW): Public health - $1,822,000
Environmental risk - $18,220,000

Alternative R-2: Removal and Incineration

This alternative has been chosen as the preferred alternative for addressing Cochato River sediment contamination. See pages 20 through 26 for a discussion of the selected remedy.

Alternative R-3: Removal and Solvent Extraction

This alternative would involve the removal of contaminated sediments, dewatering, and treatment by a solvent extraction process. In solvent extraction, contaminated sediments are mixed in a closed container with a solvent that separates contaminants from the sediments, leaving clean soil and a solvent/contaminant. This mixture is then heated to separate the solvent from the contaminants. An additional treatment process would be used to separate arsenic from the organic contaminants. The concentrated organic contaminants would be destroyed in the on-Site incinerator that would be used to treat sediments. Arsenic would be taken off-site for treatment at a federally-approved facility.

This alternative would achieve a reduction in toxicity, mobility and volume of contaminants and would comply with ARARs. This alternative would be protective of public health and the environment, though the dredging would result in damage to wetlands and the river bottom environment. Solvent extraction is an innovative technology, but it has not been proven effective for all of the contaminants found at the Site. Separate tests on Cochato River sediments would be required to develop the most effective use of this technology. Additionally, this technology would require the use of equipment on-Site (in addition to the on-Site incinerator already undergoing testing and design for the second operable unit) with associated mobilization capital costs, thereby making this alternative more expensive than the removal and incineration (R-2) alternative.

Estimated Time for Construction: 6 months
Estimated Total Cost (NPW): Public health - $2,449,000
Environmental risk - $16,291,000

X. THE SELECTED REMEDY

As anticipated in the "Future Action" section of the 1986 ROD for the Baird & McGuire Site, this (third) operable unit addresses sediment contamination in the Cochato River attributable to the Baird & McGuire Site. As such, this remedy consists of a source control component only, since only the Cochato River sediments are addressed in this operable unit.

A. Description of the Selected Remedy

1. Remedial Action Objectives/Cleanup Goals

The selected remedy was developed to satisfy the following remedial objectives, which will guide the design of the remedy and will be used to measure the success of the remedy. The objectives include:

- Reduce human exposure to arsenic, DDT, PAHs, and chlordane in sediment by excavating to an average depth of six (6) inches and by achieving the following levels of contaminants: 250 ppm for arsenic; 19 ppm for DDT; 5 ppm for chlordane; and 22 ppm for PAHs. These concentrations correspond to a 1×10^{-5} to 1×10^{-6} excess cancer risk level; and
- Reduce environmental exposure to the same 4 contaminants of concern to concentrations corresponding to the mean SQC in the river bed, and to the upper bound SQC in the wetland area north of Ice Pond.

These objectives for sediment cleanup levels were then translated into Site-specific cleanup levels on the basis of public health and environmental protection. (Refer to Section VI of this ROD, the summary of Site risks, for a discussion of the assumptions that were used for estimating public health and environmental risks.) Refer to Table 4 for the public health target levels for the 4 contaminants of concern, and to Table 5 for the Site-specific target levels for environmental risk. Figure 3 depicts the areal extent of these two remediation areas based on the public health and the environmental target levels.

While the target levels derived for protection of public health are based on a 1 x 10^{-5} excess cancer risk level, the remediation will actually achieve a greater level of protection for three of the four contaminants of concern. For the contaminants arsenic, DDT and metabolites and chlordane, a 1 x 10^{-6} excess cancer risk level will be achieved by the remediation. These levels are 250 ppm for arsenic; 19 ppm for DDT, and 5 ppm for chlordane. The only contaminant of concern that will achieve the 1 x 10^{-5} level is PAHs, which are found widely throughout the Cochato River drainage basin. It is likely, however, that natural degradative, depositional, and dispersal processes will gradually reduce contaminant concentrations in the sediment without engineering measures being taken. The rate at which these natural processes will occur is difficult to quantify. However, sampling in the areas of excavation, in conjunction with long term monitoring of downstream portions of the Cochato River that will not have sediments excavated, will confirm the remaining contaminant levels and their behavior over time.

2. Description of Remedial Components

After evaluating all of the feasible alternatives using the nine criteria for remedy selection, EPA has selected Alternative R-2 to address the contaminated Cochato River sediments for protection of public health. Because the potential public health and environmental risk areas differ from each other, EPA examined the level of response required to address each potential risk. For protection of public health, sediments will be excavated to an average depth of six inches from the area where the unnamed brook joins the Cochato River (approximately the center of the fenced Site area), downstream to approximately where the river crosses Union Street. Approximately 1,500 cubic yards of sediments will be excavated and treated. The environmental risks in this area will also be addressed by the sediment excavation. Refer to Figure 4 for a conceptual Site layout for public health risk remediation.

This alternative will involve removing the sediments using a mechanical dredge, and then incinerating the sediments using a rotary kiln incinerator. An incinerator of this type will be operating on the Site as part of the overall remedial action currently being designed to address soil contamination, as stipulated in the 1986 ROD for the second operable unit for the Site. The incinerator will utilize Best Available Control Technology, such as air scrubbers, and it will be monitored to control air emissions during operation.

Contaminated sediments will be removed using a mechanical excavator. Temporary gravel access roads will be constructed along one side of the river to enable the equipment to reach the contaminated areas. Since the need for excavation access roads will involve disruption of the wetland areas adjacent to the river in certain areas, wetlands restoration will be conducted in these disrupted areas once construction is complete. Approximately 200 cubic yards of clean backfill will be placed in the excavated portion of the river bed where the groundwater plume discharges to the Cochato River.

Since sediments may become resuspended in the river during excavation operations, silt curtains will be placed in the river downstream prior to the initiation of excavation. These silt curtains will trap suspended sediments and minimize the possibility of downstream transport. Any sediments trapped in the silt curtains will be incinerated with the excavated sediments. Remedial design will address the details of the silt curtains and will examine any other type of controls that may be appropriate during construction.

The excavated sediments will be placed in specially designed containers and trucked to the on-Site incinerator for treatment. All trucks will be decontaminated prior to returning to the excavation area for additional sediment. Prior to incineration, excess water in the excavated sediments will be reduced using a belt filter press to improve the efficiency of the incinerator. The extracted water from the sediments will be treated by the on-Site groundwater treatment plant prior to discharge.

EPA is currently testing on-Site soils at EPA's Office of Research and Development facility in Arkansas to verify the effectiveness of the incineration process for destroying the organic contamination particular to the Baird & McGuire Site. The treated soil will be tested to determine if any further treatment is required to prevent migration of any contaminants remaining in the treated material, particularly arsenic. EPA will determine if the treated sediment is subject to the Land Disposal Restrictions of the Resource Conservation and Recovery Act (RCRA). If EPA determines that the treated sediment is subject to such restrictions, the treated material will be managed in accordance with such restrictions. Treated sediment will be placed on-Site with the other treated on-Site soils, once it has been tested to ensure the material is suitable for backfill.

Long term monitoring of downstream portions of the Cochato River that will not have sediments excavated will be conducted. See the following subsection on the evaluation of wetland remediation for potential environmental impacts for further discussion.

The estimated time of operation of 6 months does not include the time required for items such as remedial design and contract bidding and award.

Removal of the sediments will result in some environmental degradation of area wetlands, but the extent of these areas are limited, and overall short and long term protection of the environment will be met. This alternative will permanently reduce the toxicity, mobility and volume of the waste, and it will comply with ARARs. Controls will be implemented to protect Site workers during excavation and treatment activities. Incineration is a proven technology that has been used successfully at a number of hazardous waste sites.

Estimated Time of Operation:	6 months
Estimated Construction Cost:	Public Health - $1,656,000
Estimated Total Cost:	Public Health - $1,656,000

3. Evaluation of Wetland Remediation for Potential Environmental Impacts

Because of the sensitivity of aquatic organisms to the Site contaminants, a much larger area of the Cochato River, as well as associated ponds and wetlands, would require remediation to completely eliminate the potential long-term risks to aquatic organisms in the river. To address the potential risk to biota living in the Cochato River, sediments would be excavated to different depths. Remediation for potential chronic environmental impacts would extend from the Baird & McGuire property, past Union Street, to approximately 1/3 of a mile downstream of the Ice Pond, including the Mary Lee Wetland. Approximately an additional 18,600 cubic yards of sediment would be excavated and treated to address these potential chronic risks to biota.

In the course of evaluating the cleanup alternatives for these downstream sediments, the EPA assessed whether or not the adverse environmental impacts associated with the excavation of these areas would be greater than the benefits of removing contaminated sediments. These downstream areas include forested and shrub swamp. Without complete remediation of these areas, the potential exists for a long-term threat to the organisms that inhabit the area. However, excavation of these downstream contaminated sediments for treatment would require extensive clearing and grubbing operations, which would disrupt the habitat and feeding grounds of a wide variety of wildlife in the area.

EPA considered the advantages and disadvantages of the options for remediation of these downstream sediments. EPA believes that the benefits obtained by excavating the additional 18,600 cubic yards of sediments are outweighed by the adverse environmental impacts associated with extremely disruptive excavation. Therefore, the EPA has decided that no action shall be taken for the sediments beyond Union Street for the protection of long term environmental risks in this area.

EPA believes that there are a number of reasons that remediation of these downstream areas is not warranted.

1. The levels of contamination downstream of Union Street are distinctly lower than those near the Baird & McGuire property.

2. Excavation of these areas is predicated on theoretical predictions of chronic, sublethal impacts to biota (Sediment Quality Criteria; SQC). Limitations of the SQC, including the inability to describe cause and effect relationships for specific chemicals, contribute to the theoretical nature of the values. Additionally, observation of the current wetland characteristics and biota population indicate that there are no observed adverse impacts in these downstream areas to date.

3. Remediation of these downstream areas, particularly the Mary Lee Wetlands, would entail serious known adverse environmental impacts. While the Agency recognizes the use of SQC on a site-specific basis as a useful tool, for this Site the known adverse impacts from excavation outweigh the theoretical impacts predicted by the SQC.

4. There are other sources of contamination in the Cochato River drainage basin. The Cochato River is an urban basin with a variety of point and non-point sources of contamination, and tributary sampling indicates a number of contaminants exist in the area that are not attributable to the Baird & McGuire Site.

Therefore, since no action will be taken in these downstream areas, EPA will include long term monitoring of these areas on an annual basis. To the extent required by law, EPA will review this monitoring data at least once every five years to assure that the remedial action continues to protect public health. EPA will also evaluate the risk posed by the Site at the completion of the overall Site remedial action (i.e., before the Site is proposed for deletion from the NPL).

B. Rationale for Selection

The rationale for choosing the selected alternative is based on the assessment of each criteria listed in the evaluation of alternatives section of this document. In accordance with Section 121 of CERCLA, to be considered as a candidate for selection in the ROD, the alternative must have been found to be protective of human health and the environment and able to attain ARARs unless a waiver is granted. In assessing the alternatives that met these statutory requirements, EPA focused on the other evaluation criteria, including short term effectiveness, long term effectiveness, implementability, use of treatment to permanently reduce the mobility, toxicity and volume, and cost.

EPA also considered nontechnical factors that affect the implementability of a remedy, such as state and community acceptance. The State and the Baird & McGuire Task Force have indicated their acceptance of the remedy. Both the State and the Task Force requested that additional monitoring be conducted as a part of the overall remedy, and this provision has been added to the selected remedial alternative. Other community concerns are focused on the operation of the incinerator. EPA believes these concerns are addressed by specifying compliance with the RCRA incinerator standards, as well requiring air monitoring to ensure that all federal and state air standards are attained. Based upon this assessment, taking into account the statutory preferences of CERCLA, EPA has selected the remedial approach for the Site.

Table 6 presents a comparative summary of the six remedial alternatives that were carried through detailed analysis. Of the six alternatives, NR-1, NR-2, and NR-3 do not attain ARARs, and also do not satisfy CERCLA's preference for permanent remedies. Of the three (removal) alternatives which attain ARARs, all three alternatives are similar in terms of short-term effectiveness. Regarding long-term effectiveness, the reliability of the solvent extraction technology (Alternative R-3) is uncertain for the variety of Baird & McGuire Site contaminants. Both Alternatives R-2 and R-3 are more likely to have residual on-Site risk than Alternative R-1; however, these two alternatives are much more effective than Alternative R-1 in the reduction of mobility, toxicity, or volume of the contaminants. Regarding implementability, Alternative R-3 is unproven on the Baird & McGuire Site contaminants and would require treatability testing; also, Alternative R-1 would require transportation of saturated sediments over long distances and disposal permits for off-site RCRA landfilling. Of the three alternatives, R-2 is less expensive than either Alternatives R-1 or R-3.

While all three removal alternatives satisfy ARARs, the off-site land disposal without treatment in Alternative R-1 is the least favored remedial action under CERCLA. The State and the community, through its public comments, have indicated general agreement with the selection of Alternative R-2, and the State has concurred with the selection of Alternative R-2 as the remedial action for this operable unit.

Incineration is a demonstrated treatment technology, while the full-scale reliability of solvent extraction is uncertain for the variety of contaminants found at the Baird & McGuire Site. Additionally, since the second operable unit for the Site calls for on-Site incineration, Alternative R-2 benefits from the ongoing testing and capital equipment costs that will be borne by that phase of activity. Alternative R-3 would require additional testing and capital equipment expenditure, thereby making Alternative R-2 more cost effective. The additional equipment and resultant space required for the operation of a solvent extraction unit would have to compete with the incinerator for limited space on-Site in which to operate.

Therefore, for the reasons stated above, EPA believes that Alternative R-2, the selected remedy, is the best balance among the nine criteria that were used to evaluate all of the alternatives.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Baird & McGuire Site/Cochato River Sediments is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy also satisfies the statutory preference for a permanent solution and for treatment which reduces the mobility, toxicity or volume as a principal element. Additionally, the selected remedy utilizes alternate treatment technologies to the maximum extent practicable.

A. The Selected Remedy is Protective of Human Health and the Environment

The selected remedy is protective of human health and the environment. The remedy at this Site will permanently reduce the risks presently posed to human health and the environment by excavating and treating the contaminated sediments. Removing sediments to an average depth of six inches will protect public health, and the environmental risks in this area will also be addressed.

EPA examined the sediment volume that would be associated with a public health excess cancer risk level of 1 x 10^{-6}. The sediment volume would increase to approximately 7,325 cubic yards over a two-mile reach of the Cochato River (volumes for tributaries are not included), covering an area more extensive than that for chronic environmental protection, due predominantly to the PAH target cleanup level. Extensive wetland disruption would occur, considering the discontinuous nature of the remediation areas. Refer to Table 7 and the affiliated map for volume calculations.

While the target levels derived for protection of public health are based on a 1 x 10^{-5} cumulative excess cancer risk level, the remediation will actually achieve a greater level of protection for three of the four contaminants of concern. For the contaminants arsenic, DDT and metabolites and chlordane, a 1 x 10^{-6} excess risk level will be achieved by the remediation. The contaminant of concern that will achieve only the 1 x 10^{-5} level is PAHs, which are found widely throughout the Cochato River drainage basin. It is likely, however, that natural degradative, depositional, and dispersal processes will gradually reduce contaminant concentrations in the sediment without engineering measures being taken. The rate at which these natural processes will occur is difficult to quantify. However, sampling in the areas of excavation, in conjunction with long tern monitoring of downstream portions of the Cochato River that will not have sediments excavated, will confirm the remaining contaminant levels and their behavior over time.

Although environmental risks will be addressed by the excavation of sediments to approximately Union Street, sediment downstream of Union Street will not be addressed. The four primary reasons for the decision not to remediate areas downstream of Union Street are as follows:

1. Contamination levels downstream of Union Street are distinctly lower than those within 500 feet of the Baird & McGuire property.

2. Excavation of these areas is predicated on theoretical predictions of chronic, sublethal impacts to biota (Sediment Quality Criteria; SQC). Limitations of the SQC, including the inability to describe cause and effect relationships for specific chemicals, contribute to the theoretical nature of the values. Additionally, observation of the current wetland characteristics and biota population indicate that there are no observed adverse impacts in these downstream areas to date.

3. Remediation of these downstream areas, particularly the Mary Lee Wetlands, would entail serious known adverse environmental impacts. While the Agency recognizes the use of SQC on a site-specific basis as a useful tool, for this Site the known adverse impacts from excavation outweigh the theoretical impacts predicted by the SQC.

4. There are other sources of contamination in the Cochato River drainage basin. The Cochato River is an urban basin with a variety of point and non-point sources of contamination, and tributary sampling indicates a number of contaminants exist in the area that are not attributable to the Baird & McGuire Site.

Therefore, in an attempt to balance the need to remediate the more severely contaminated zones of sediment contamination while minimizing damage to the existing environmental value of the area, the Agency has determined that excavation will extend only to Union Street.

B. The Selected Remedy Attains ARARs

The selected remedy will attain all federal or state requirements that are applicable or relevant and appropriate. Environmental laws which are applicable or relevant and appropriate to the selected remedial action at the Baird & McGuire Site/Cochato River Sediments are:

Resource Conservation and Recovery Act (RCRA)
Clean Water Act (CWA)
Executive Order 11988 (Floodplain Management)
Executive Order 11990 (Protection of Wetlands)
Clean Air Act (CAA)
Occupational Safety and Health Act (OSHA)

310 CMR 30.00 - Hazardous Waste Management Requirements
310 CMR 6.00 - Ambient Air Quality Standards for the Commonwealth of Massachusetts
310 CMR 7.00 - Air Pollution Control Regulations
310 CMR 10.00 - Wetlands Protection Requirements
310 CMR 33.00 - Employee and Community Right To Know Requirements
314 CMR 4.00 - Surface Water Quality Standards
314 CMR 9.00 - Certification for Dredging and Filling
302 CMR 6.00 - Inland Wetlands Orders

Tables 8, 9, and 10, taken from Chapter 2 of the Focused Feasibility Study, list the potential chemical-, location-, and action-specific ARARs, criteria, advisories, and guidance identified in the FFS, respectively. Tables 8 and 9 indicate the requirement and its status, a brief synopsis of the requirement, and the consideration the requirement was given in the FFS. Table 10 lists the action-specific ARARs and a summary of the requirement. Of those potential ARARs identified in the FFS, the above-listed requirements are applicable or relevant and appropriate to the selected remedial action. A brief narrative summary of the ARARs for the selected remedy follows.

The Resource Conservation and Recovery Act (RCRA) and the State Hazardous Waste Management Regulations (310 CMR 30.00) are considered applicable to the Site. As such, the on-Site incinerator will be required to operate in accordance with these requirements. Additionally, remedial activities may be subject to the Land Disposal Restrictions under RCRA. EPA is currently conducting tests of the treated material. If EPA determines that the material is subject to these restrictions, the material will be handled in accordance with these requirements, and further treatment may be needed. If not, the treated material will be used as backfill on the Site.

Regarding the floodplains, the remedy will comply with Executive Order 11988 - Protection of Floodplains. EPA finds that there is no practicable alternative to excavation of the contaminated sediments, some of which are located in the floodplain, since it is the sediments themselves that are contaminated. Implementation of the remedy will utilize measures to minimize potential harm to the floodplain. However, excavation and filling are temporary disruptions, and any filling will match preconstruction topography. Thus, there will not be any permanent disruption of the floodplain values.

Similarly for the wetlands, the remedy will comply with Executive Order 11990 - Protection of Wetlands, the Clean Water Act Section 404(b)(1) guidelines, and the State Surface Water Quality Standards (314 CMR 4.00), Wetland Protection Requirements (310 CMR 10.00), Inland Wetlands Orders (302 CMR 6.00) and Certification for Dredge and Fill (314 CMR 9.00). The Cochato River sediments have been affected by the Site activities, and they will be affected by the remedy. Because the river sediments exceed the cleanup goals, these sediments will be excavated for thermal treatment. EPA finds that there is no practicable alternative to these actions since it is the sediments in the river themselves that are contaminated. Implementation of the remedy will utilize measures to minimize potential harm to the surrounding areas and wetlands. The backfill that will be placed in the vicinity of the groundwater plume discharge to the river will be placed at approximately a six-inch depth to approximate the original contours of the river bed. Additionally, the area is expected to silt in quickly with the surrounding sediments. Any fill activity is considered to be in compliance with the Executive Order, and is a part of the restoration and preservation of the beneficial values of wetlands and floodplains.

During excavation and treatment of contaminated sediments, air emissions will be monitored and all relevant federal and state standards will be attained. Specifically, the National Ambient Air Quality Standards (NAAQS), and the State Ambient Air Quality Regulations (310 CMR 6.00) and the Air Pollution Control Regulations (310 CMR 7.00) will be met through specified techniques for the excavation activities, as well as required air emission controls and monitoring for the incinerator, to ensure that Site-specific ambient action levels are not exceeded.

During the excavation and treatment of contaminated sediments, Occupational Health and Safety Act (OSHA) regulations will be followed, as well as the Employee and Community Right To Know Requirements (310 CMR 33.00). In particular, 29 CFR 1910.120 of OSHA specifies standards for handling hazardous wastes and 29 CFR 1910.1000 sets allowable ambient air concentrations for activities which involve release of VOCs in the workplace. This is not expected to be a problem during remediation, since the sediments will be excavated while they are submerged and then brought to the Site for dewatering prior to incineration. However, air monitoring will be conducted to ensure that allowable levels are not exceeded.

C. The Selected Remedial Action is Cost-Effective

The selected remedy is cost-effective. Once EPA has identified alternatives that are protective and attain ARARs, EPA analyzes those alternatives to determine a cost-efficient means of achieving the cleanup.

The estimated cost of excavation and incineration is cost effective when compared with all of the Removal Alternatives, and particularly Alternative R-3, the one other (removal) alternative that provides an equivalent level of protectiveness and attains ARARs. The non-removal alternatives all are less protective than Alternative R-2, since they do not adequately reduce the risks posed to human health and the environment by the Site. Additionally, EPA believes that the remedy is cost effective due to the fact that incineration will permanently destroy the organic contamination. Future remedial action with associated costs for the non-removal alternatives may be needed if the contaminated sediments are left in the river.

Further, since the second operable unit for the Site calls for on-Site incineration, Alternative R-2 benefits from the ongoing testing and capital equipment costs that will be borne by that phase of activity. Alternative R-3 would require additional testing and capital equipment expenditure, thereby making Alternative R-2 more cost effective.

The actual costs for on-site incineration are difficult to estimate precisely. However, the $325 per cubic yard estimate is within the range provided by guidance and vendor quotes. Refer to Table 11 for a comparison of the cost estimates for the removal alternatives. Unit costs and supporting calculations are included in Appendix D of the FFS.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. Incineration is a treatment technology that will provide a permanent solution to the contaminated sediment problem in the Cochato River due to the Baird & McGuire Site. Excavation of the top six inches of sediment and treatment by incineration will reduce the risks posed to public health from direct contact with contaminated sediments in this area, as well as addressing the environmental risks in this area.

E. The Selected Remedy Satisfies the Preference for Treatment as a Principal Element

The remedy satisfies the statutory preference for treatment that permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances as a principal element. The principal element of the selected remedy is the excavation and on-Site incineration of the contaminated sediments. This element addresses the primary threat at the Site, contaminated river sediments, by utilizing thermal treatment.

XII. STATE ROLE

The Massachusetts Department of Environmental Protection (DEP) has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the

Record of Decision to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. The Commonwealth of Massachusetts concurs with the selected remedy for the Baird & McGuire Site/Cochato River Sediments. A copy of the declaration of concurrence is attached as Appendix C. In accordance with Section 104 of CERCLA, Massachusetts is responsible for 10 percent of the cost of the remedial action and for operation and maintenance costs. In the case of the selected remedy, the Commonwealth's share is estimated at approximately $165,000.

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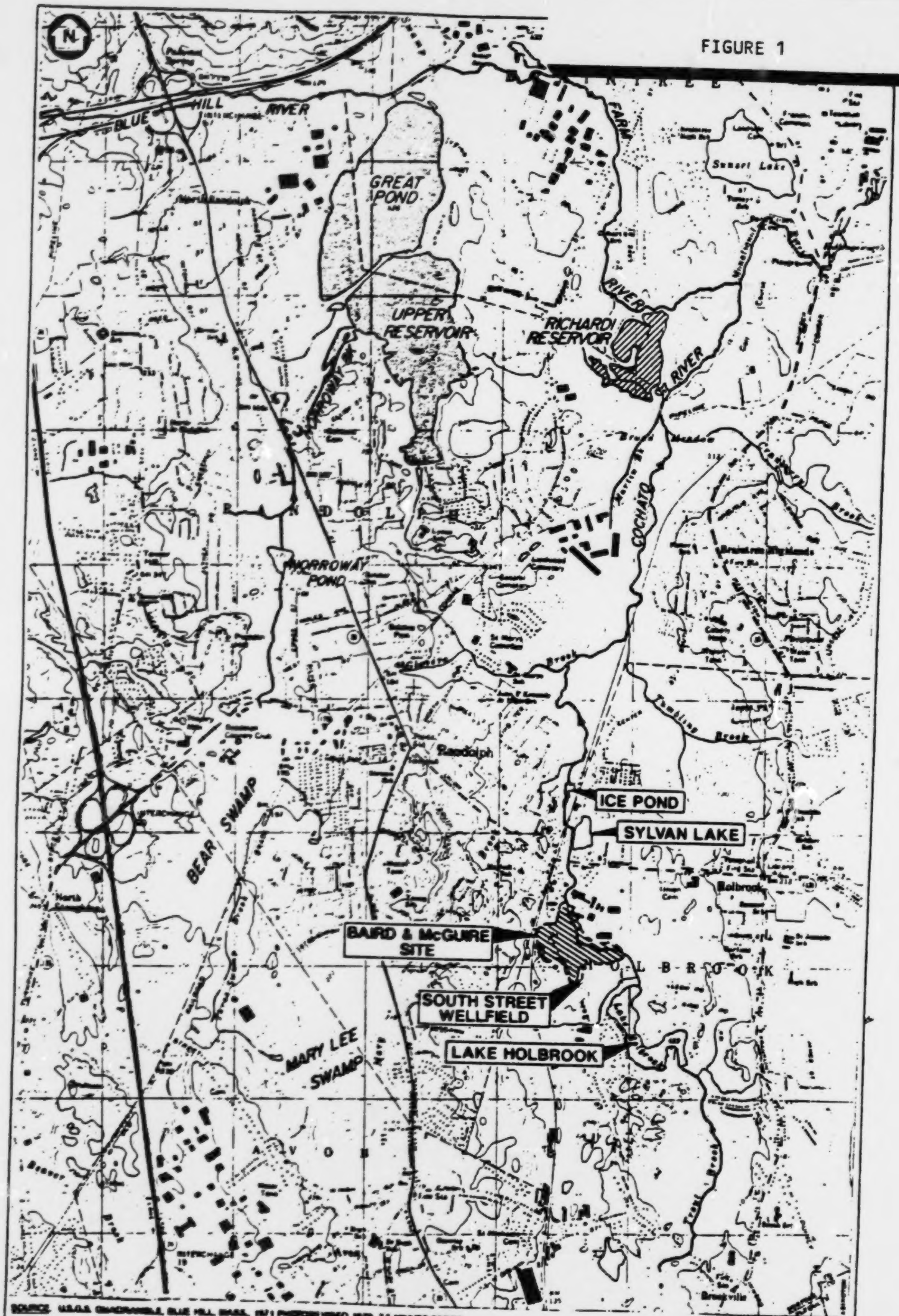
FIGURE 1



SOURCE: U.S.G.S. QUADRANGLE, BLUE HILL, MASS., 1971 PHOTOREVISED 1979, 7.5 MINUTE SERIES

0 2000 4000 FEET

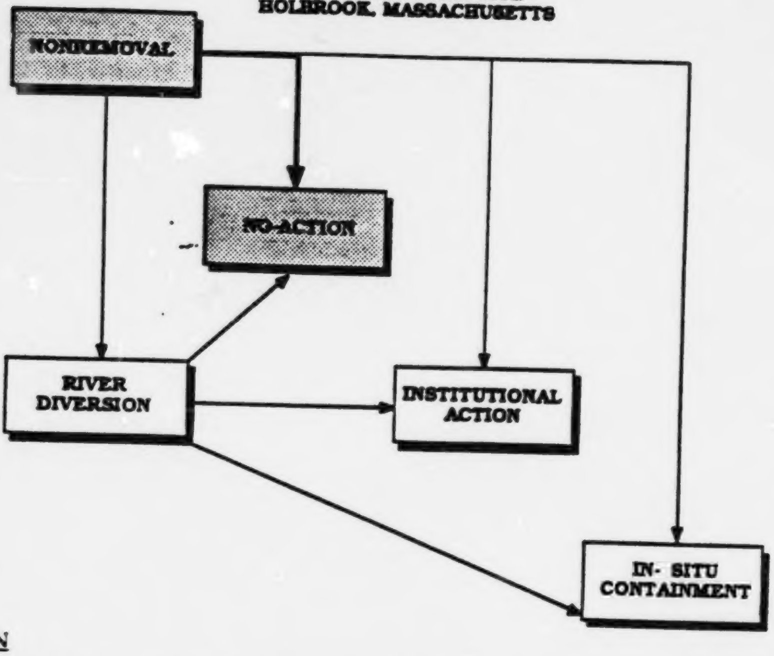
2444-01

STUDY AREA LOCATION MAP
COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

SCREENING OF ALTERNATIVE NR-1: NO ACTION

FIGURE 2

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



NR-1 NO-ACTION

The no-action alternative involves no remedial or institutional action to treat contaminated sediment or reduce the potential for exposure. A reassessment of site conditions would be conducted every five years.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- None	- Negligible effort to implement	- Negligible costs; five-year review
Disadvantages	**Disadvantages**	**Disadvantages**
- No reduction in existing risks - Fails to reduce potential for exposure - Fails to achieve reduction in mobility, toxicity, or volume of contaminants - Potential exists for future remedial action	- Not consistent with CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce toxicity, mobility or volume of hazardous substances, pollutants, or contaminants - Would not meet chemical-specific TBCs	- High potential for future remedial action costs

Protection of Public Health and the Environment:

This alternative offers no additional protection of public health and the environment over existing conditions.

Remedial Action Objectives Achieved:

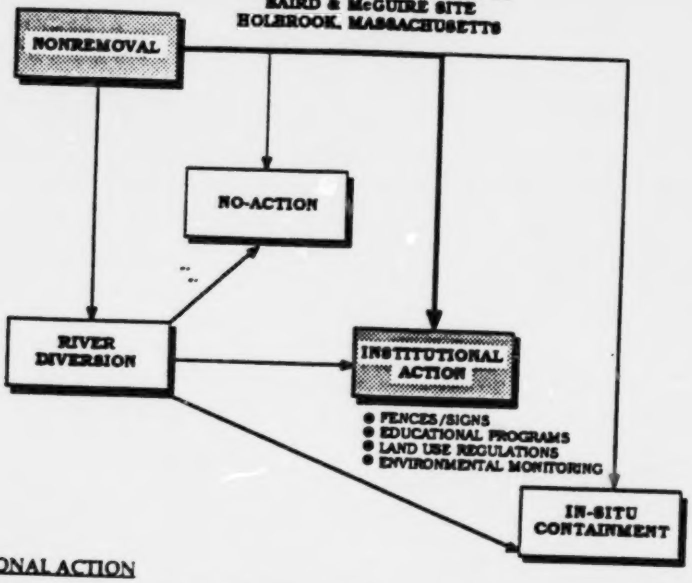
This alternative fails to achieve sediment remedial action objectives.

Conclusion:

This alternative will be retained for detailed analysis because it will serve as the base conditions alternative to which other alternatives will be compared.

SCREENING OF ALTERNATIVE NR-2: INSTITUTIONAL ACTION

COCHATO RIVER SEDIMENT FSS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



NR-2 INSTITUTIONAL ACTION

This alternative includes site fencing and posting warning signs. Long-term environmental monitoring would be performed to evaluate site conditions over time.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Reduces potential for exposure through site access and land use restrictions.	- Fencing reliably restricts site access by humans and large terrestrial organisms in the short-term. - Fence installation services available; institutional controls obtainable through legal channels. - Does not interfere with ability to perform future remedial action.	- Minimal construction and capital costs.
Disadvantages	**Disadvantages**	**Disadvantages**
- Fails to achieve reduction in mobility, toxicity, or volume of contaminants. - Potential exists for future remedial action.	- Coordination required to identify parties responsible for securing institutional controls and conducting monitoring. - Not consistent with CERCLA/SARA goals/ intent to select remedial actions which permanently and significantly reduce toxicity, mobility or volume of hazardous substances, pollutants, or contaminants. - Would not meet chemical-specific TBCs.	- Long-term O&M costs for environmental monitoring. - Five-year review costs. - Potential for future remedial action costs.

Protection of Public Health and the Environment:

Minimal protection to public health and the environment provided by fence and institutional controls.

Remedial Action Objectives Achieved:

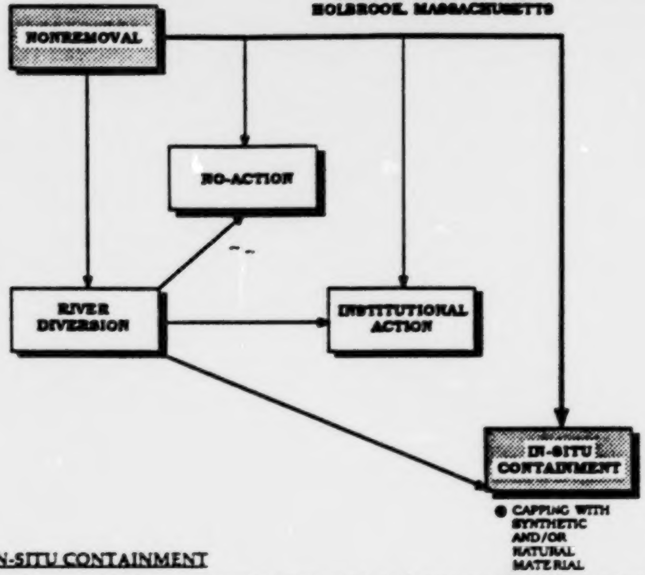
This alternative reduces to potential for ingestion/contact with sediment through institutional controls.

Conclusion:

This alternative will be retained for detailed analysis since it requires minimal expenditures and reduces the potential for exposure to contaminants.

SCREENING OF ALTERNATIVE NR-3: IN-SITU CONTAINMENT

COCHATO RIVER SEDIMENT FS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



NR-3 IN-SITU CONTAINMENT

In-situ containment involves covering the contaminated sediments in place with clean synthetic and/or natural inert material to reduce the potential for exposure. Long-term environmental monitoring would be necessary to monitor cap integrity over time.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages - Reduces exposure risk to public health and the environment by covering sediment. - Public health remedial action objectives achieved in approximately one year.	**Advantages** - Soil cover and revegetation readily constructible. - Equipment personnel and materials for soil cover readily available.	**Advantages** - Less costly than treatment alternatives. - Construction and capital and O&M costs well-defined.
Disadvantages - Fails to achieve reduction in mobility, toxicity, or volume of sediments. - Potential exists for future remedial action. - Potential for contaminated sediment to become resuspended and migrate downstream as a result of capping activities.	**Disadvantages** - Not consistent with CERCLA/SARA goals/intent to select remedial actions that permanently and significantly reduce toxicity, mobility or volume of hazardous substances, pollutants, or contaminants. - Would not meet chemical-specific TBCs. - Gravel access roads to remain in place for cap inspection and maintenance purposes. - Location-specific ARARs governing wetlands and floodplains may require enhancement, restoration or creation of wetlands or floodplains destroyed or negatively impacted by cover placement and access road installation.	**Disadvantages** - Long-term costs for cover maintenance. - Long-term costs for environmental monitoring. - Five-year review costs. - Potential for future remedial action costs.

Protection of Public Health and the Environment:

For Alternative NR-3, risks from direct contact would be controlled by cover material above sediment, however, negative impacts of cover system on benthic community uncertain.

Remedial Action Objectives Achieved:

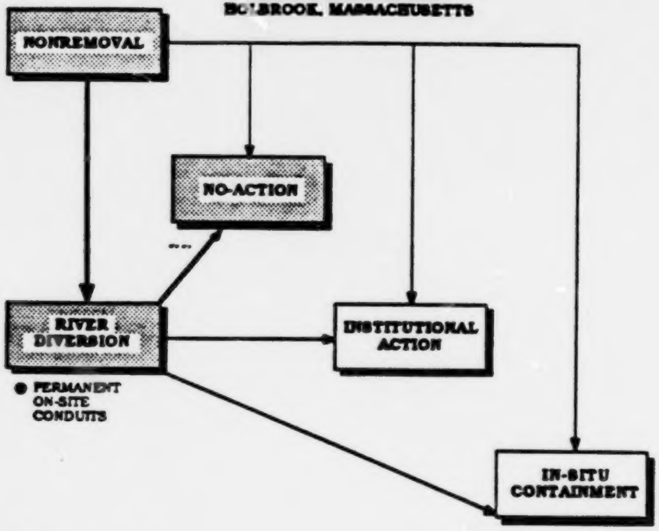
This alternative achieves remedial action objectives related to public health protection from sediment. Remedial action objectives established to protect environment not complete.

Conclusion:

This alternative will be retained for detailed analysis since it reduces the potential for direct contact with sediment and offers a less costly alternative than treatment alternatives.

SCREENING OF ALTERNATIVE RD-NR-1
RIVER DIVERSION/NO ACTION

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



RD-NR-1 RIVER DIVERSION/NO-ACTION

This alternative calls for dewatering of contaminated sediment by rerouting river water flow away from the contaminated areas, thereby reducing the potential for contaminant migration via surface water. The sediment would remain in-place with no further action taken.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Permanent diversion produces a reduction in potential for contaminant migration via surface water flow.	- None.	- None.
Disadvantages	**Disadvantages**	**Disadvantages**
- Fails to reduce potential risk for public and biota dermal contact and ingestion. - Fails to achieve reduction in mobility, toxicity, or volume of contaminants. - Potential exists for future remedial action. - River diversion and no-action components not effective in reducing potential for exposure to sediments (access increased)	- Complex to implement, with no risk reduction. - Not consistent with the CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants or contaminants. - River diversion complex to implement would need to be closely coordinated with on-site soils remediation activities. - Location-specific ARARs governing wetlands and floodplains may require enhancement, restoration or creation of wetlands or floodplains destroyed or negatively impacted from the construction of access road and diversion of the Cochato River. - Chemical-specific TBCs will not be met.	- Substantial construction costs plus monitoring and review. - High potential for future remedial action costs.

Protection of Public Health and the Environment:

This alternative offers a reduction in the potential for contaminant migration via surface water flow, however it also provides for a greater potential for dermal contact and ingestion by making the contaminated sediments more accessible to terrestrial organisms.

Remedial Action Objectives Achieved:

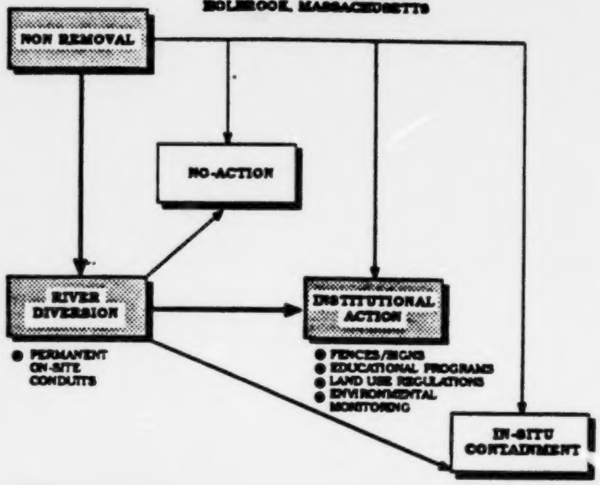
This alternative fails to achieve sediment remedial action objectives.

Conclusion:

This alternative will be eliminated from further consideration because it offers no additional reduction in risk over Alternative NR-1, No Action, and involves expensive construction activities.

SCREENING OF ALTERNATIVE RD-NR-2
RIVER DIVERSION/INSTITUTIONAL ACTION

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



RD-NR-2 RIVER DIVERSION/INSTITUTIONAL ACTION

This alternative is a combination of Alternatives NR-2 and RD-NR-1. This alternative specifies dewatering of contaminated sediment using flow diversion techniques coupled with site fencing, posting of warning signs, implementation of educationalprograms, and regulation of land use to protect the public from potential exposure. Long-term monitoring would be performed to evaluate site conditions over time.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Reduces potential for exposure through site access and land use restrictions. - Permanent river diversion reduces the potential for contaminant migration via surface water flow.	- Fencing reliably restricts site access by humans and large terrestrial organisms in the short-term. - Fence installation services available; institutional controls obtainable through legal channels. - Does not interfere with ability to perform future remedial action.	- None.
Disadvantages	**Disadvantages**	**Disadvantages**
- Fails to achieve reduction in mobility, toxicity, or volume of contaminants. - Potential exists for future remedial action.	- Coordination required to identify parties responsible for securing institutional controls and conducting monitoring. - Not consistent with CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce toxicity, mobility or volume of hazardous substances, pollutants, or contaminants. - Location-specific ARARs governing wetlands and floodplains may require enhancement, restoration, or creation of wetlands or floodplains destroyed or negatively impacted from the construction of access roads and diversion of the Cochato River. - Chemical-specific TBCs will not be met. - River diversion complex to implement, would need to be closely coordinated with on-site soils remediation activities.	- Long-term O&M costs for environmental monitoring. - Five-year review costs. - Potential for future remedial action costs. - River diversion cost high, would require maintenance.

Protection of Public Health and the Environment:

Minimal protection to public health and the environment provided by fence, and institutional controls. Permanent diversion reduces potential for contaminant migration via surface water flow. No reduction of toxicity, mobility or volume of contaminants achieved.

Remedial Action Objectives Achieved:

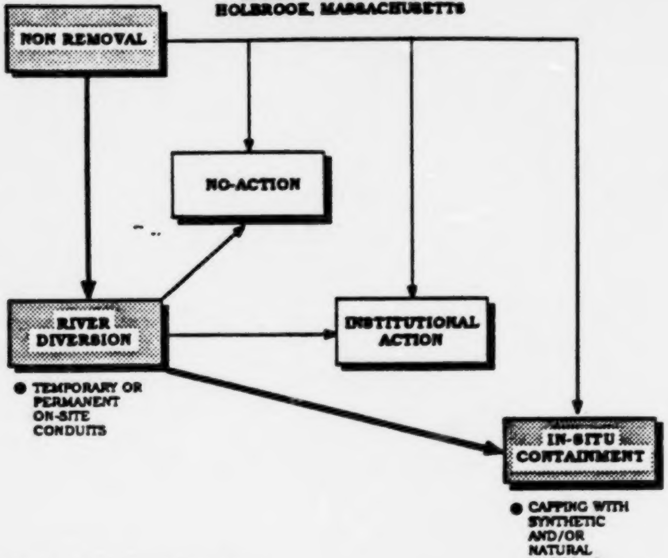
This alternative reduces the potential for human ingestion/contact with sediment through institutional controls component. Should institutional controls fail (e.g., fence integrity), exposed sediments would be more easily accessible for contact/ingestion potential. Ecological receptors uninhibited by institutional controls (e.g., birds and small terrestrial animals) would experience increased risk due to exposed contaminated sediments.

Conclusions:

This alternative will be eliminated from further consideration because it is more complex to implement and it offers no additional reduction in risk over alternative NR-2.

SCREENING OF ALTERNATIVE RD-NR-3
RIVER DIVERSION/IN SITU CONTAINMENT

COCHATO RIVER SEDIMENT FSS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS


NON REMOVAL
NO-ACTION
RIVER DIVERSION
INSTITUTIONAL ACTION
● TEMPORARY OR PERMANENT ON-SITE CONDUITS
IN-SITU CONTAINMENT
● CAPPING WITH SYNTHETIC AND/OR NATURAL MATERIAL

RD-NR-3 RIVER DIVERSION/IN-SITU CONTAINMENT

This alternative is a hybrid of Alternatives NR-3 and RD-NR-1. This alternative specifies dewatering of contaminated sediment via river diversion, and the installation of a cap over the contaminated sediment. Cap material may be a synthetic geotextile or natural inert material, or a combination of the two. The river diversion component of this alternative may be either permanent or temporary.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Reduces exposure risk to public health and the environment by covering sediment. - Public health remedial action objectives achieved in approximately one year.	- Soil cover and revegetation readily constructible. - Equipment personnel and materials readily available. - Level C dermal, D respiratory worker protection during cover operations likely.	- Less costly than diversion and treatment alternatives. - Construction and capital and O&M costs well-defined.
Disadvantages	**Disadvantages**	**Disadvantages**
- Fails to achieve reduction in mobility, toxicity, or volume of sediment. - Potential exists for future remedial action. - River diversion does not increase cover system effectiveness.	- Diversion complex to implement. - Diversion construction would require close coordination with on-site soils remediation activities. - Not consistent with CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce toxicity, mobility or volume of hazardous substances, pollutants, or contaminants. - Location-specific ARARs governing wetlands and floodplains may require enhancement, restoration, or creation of wetlands or floodplains destroyed or negatively impacted from the construction of access roads and diversion of the Cochato River. - Chemical-specific TBCs will not be met.	- Long-term costs for cover maintenance. - Long-term costs for diversion maintenance. - Five-year review costs. - Potential for future remedial action costs.

Protection of Public Health and the Environment:

For Alternative NR-3, risks from direct contact would be controlled by cover material above sediment.

Remedial Action Objectives Achieves:

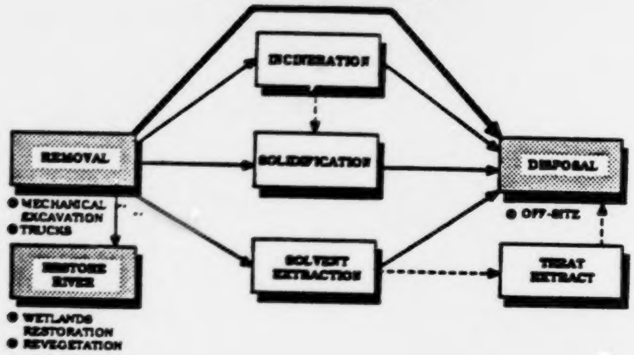
This alternative achieves remedial action objectives related to public health protection from sediment. Remedial action objectives established to protect environment not entirely met.

Conclusions:

This alternative will be eliminated from further consideration because it provides no potential exposure reduction over Alternative NR-3.

SCREENING OF ALTERNATIVE R-1: REMOVAL/DISPOSAL

COCHATO RIVER SEDIMENT FSS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



R-1 REMOVAL DISPOSAL

This alternative specifies mechanical excavation of contaminated sediment. Access to the river adjacent to the Baird & McGuire site will have been provided as part of the ongoing source control remedial action, and therefore, will not need to be done for this activity. Access to down-stream contaminated sediment would be provided by the installation of a gravel road adjacent to those portions of the river to be remediated. If necessary, the sediment would be dewatered on-site by gravity or mechanical means, and transported via truck to an off-site RCRA landfill for disposal. Water extraction from the sediment dewatering process would be collected and treated at the on-site groundwater treatment plant specified in the 1987 Baird & McGuire site source control-ROD.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Reduces mobility of contaminants in sediment by consolidation in a secure landfill. - Reduce existing and long-term risks associated with direct contact with sediment.	- Equipment, personnel, and materials for excavation dewatering, transportation of dewatered sediment and treatment of extract water available. - Consolidates waste in a single location. - Off-site RCRA landfill compatible for disposal of solid waste materials. - Makes use of on-site water treatment plant provided by 1986 Baird & McGuire site source control ROD.	- Limited potential for future remedial action costs. - Long-term environmental monitoring/maintenance responsibility of RCRA landfill selected. - No associated long-term environmental monitoring/ maintenance costs.
Disadvantages	**Disadvantages**	**Disadvantages**
- Excavation and waste handling pose short-term risk risk to workers. - Land disposal regulations require treatment of excavated wastes prior to disposal. - Not consistent with SARA preference for on-site remedies. - Remedial action objectives achieved subject to on-site remedial action schedule.	- Significant waste volume necessitates use of large RCRA landfill to contain solidified material. - Not consistent with CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce toxicity, mobility or volume of hazardous substances, pollutants, or contaminants. - Off-site land disposal without treatment is the least favored remedial action under CERCLA/ SARA.	- Invasive remedial activities require worker protection and increase costs. - Significant cost for transportation and disposal at a RCRA landfill.

Protection of Public Health and the Environment:

Alternative R-1 reduces risk from direct contact by consolidating all waste material in an off-site RCRA landfill.

Remedial Action Objectives Achieved:

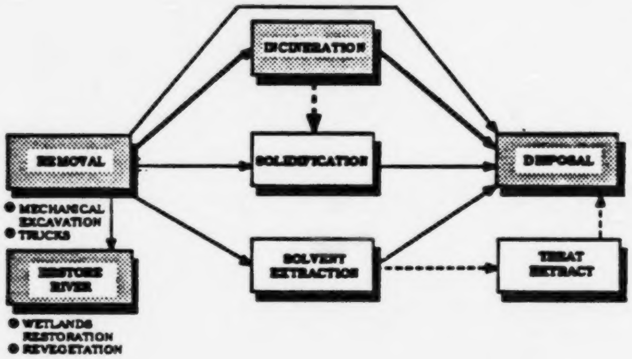
This alternative achieves the sediment remedial action objectives.

Conclusion:

This alternative will be retained for detailed analysis. While Alternative R-1 does not provide treatment to reduce the mobility, toxicity, or volume of contaminants in sediment it provides consolidation and containment in a RCRA landfill. This alternative may be compared with Alternatives R-2 and R-3 to weigh the benefits and costs of sediment treatment and management of treatment residuals.

SCREENING OF ALTERNATIVE R-2: REMOVAL/INCINERATION

COCHATO RIVER SEDIMENT FSS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



R-2 REMOVAL/INCINERATION/DISPOSAL

Components of this alternative include contaminated sediment excavation and on-site dewatering, if necessary, as described in Alternative R-1, along with treatment of the dewatered sediment to reduce toxicity. The treatment process would involve incineration using the on-site source control remedial action incinerator. Residual metals and ash would be solidified on site prior to disposal.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Reduces mobility and volume of contaminants in sediment through incineration. - Permanently destroys organic constituents in sediment. - Reduces existing and long-term risks associated with direct contact with sediment.	- Equipment, personnel, and technologies for incineration available through on-site soil remedial action. - Incineration feasible for treatment of solid waste. - Consistent with CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants.	- O&M costs incurred only during remediation. - No five-year review. - No incinerator mobilization fee.
Disadvantages	**Disadvantages**	**Disadvantages**
- Excavation and waste handling pose short-term risk risk to workers. - Incineration may increase the toxicity of inorganic constituents in residual ash which may require solidification and off-site RCRA landfilling. - Onsite incineration of sediment is subject to soil remediation schedules.	- Potentially requires secondary waste management of residual ash from incineration. - Potential administrative feasibility problems: - requires coordination with several federal/ state agencies.	- Invasive remedial activities require worker protection and increase costs. - Multiple process schemes to fix residual metals and ash will increase costs (if required). - Increased costs due to transport and disposal of solidified matrices in RCRA landfill (if required).

Protection of Public Health and the Environment:

This alternative offers protection to public health and the environment by reducing potential for direct contact with contaminants. Excavating wastes would reduce the potential for contaminant migration.

Remedial Action Objectives Achieved:

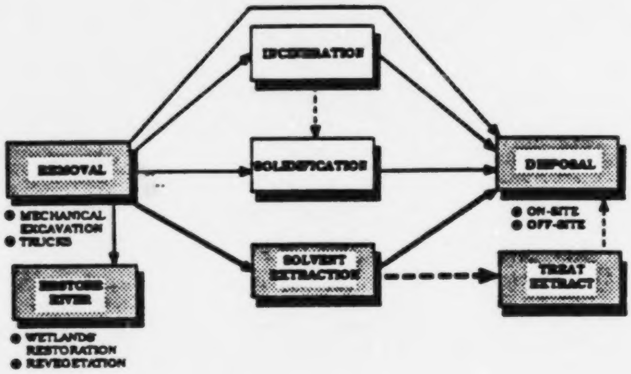
Alternative R-2 achieves the source control remedial action objectives, but proper waste management of residual ash from incineration must be performed if the ash contains toxic and leachable metals.

Conclusion:

This alternative will be retained for detailed analysis. The significant reduction in waste toxicity and mobility make this alternative consistent with the intent of SARA requirements.

SCREENING OF ALTERNATIVE R-3
REMOVAL/SOLVENT EXTRACTION

COCHATO RIVER SEDIMENT FS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



R-3 REMOVAL/SOLVENT EXTRACTION

Contaminated sediment excavation is a component of this alternative as described in previously presented alternatives. A dewatering step may not be necessary prior to solvent extraction due to treatment processes. Sediment will be treated by solvent extraction processes with extract residuals also undergoing treatment. Water would be drawn off from the process and treated at the on-site source control water treatment plant. Extracted solvent would be drummed and treated and/or disposed of at an off-site RCRA TSD facility or via on-site source control incineration (and solidification of residual metals and ash if necessary).

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Reduces mobility and volume of contaminants in sediment through incineration. - Reduces existing and long-term risks associated with direct contact with sediment.	- Innovative alternative treatment technology (solvent extraction). - Proven effective treatment process for pesticide and PAH extraction from soils. - Treated sediment may be suitable for backfilling at the Baird & McGuire site. - Consistent with CERCLA/SARA goals/intent to select remedial actions which permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants.	- O&M costs incurred only during remediation. - No five-year review. - No disposal costs should treated sediments be suitable for backfilling at Baird & McGuire site.
Disadvantages	**Disadvantages**	**Disadvantages**
- Excavation and waste handling pose short-term risk to workers. - Remedial action objectives achieved subject to on-site remedial action schedule.	- Solvent extraction technologies not fully demonstrated for arsenic. - Treatability test required.	- Invasive remedial activities require worker protection and increase costs. - Multiple process schemes require treatment or recycling and will increase costs. - Potential for future remedial action costs if solvent-extraction process fails to effectively remove arsenic.

Protection of Public Health and the Environment:

Alternative R-3 provides protection to public health and the environment by reducing potential for direct contact with contaminants.

Remedial Action Objectives Achieved:

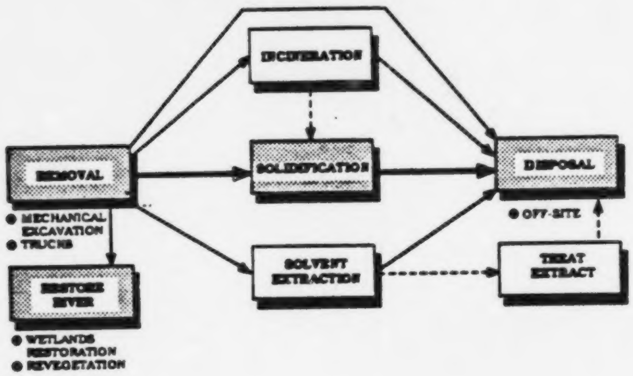
This alternative achieves remedial action objectives.

Conclusion:

This alternative will be retained for detailed analysis. This alternative is consistent with the intent of SARA. This alternative involves an innovative technology that offers potential for extracting contaminants from sediments.

SCREENING OF ALTERNATIVE R-4: REMOVAL/SOLIDIFICATION

COCHATO RIVER SEDIMENT FSS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



R-4 REMOVAL/SOLIDIFICATION

This alternative is similar to alternative R-2. The exception is that the incineration step is left out of the treatment process. The dewatered excavated sediment is solidified on-site to reduce contaminant mobility, and disposed of by off-site RCRA landfilling.

	EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	- Reduces mobility of metals in sediment by solidification treatment and placement in a secure landfill. - Reduces existing and long-term risks associated with direct contact with sediment. - Offers treatment of wastes prior to land disposal.	- Soil solidification proven technology at other sites for some metals. - Equipment, personnel, and technologies readily available. - Solidified waste materials landfill compatible. - Consolidates waste in a single location.	- Solidification costs are lower than for other treatment alternatives. - Limited potential for future remedial action costs.
Disadvantages	- Excavation and waste handling pose short-term risk to workers. - Remedial action objectives achieved subject to on-site remedial action objectives. - Solidification treatment significantly increases volume and weight of contaminated material. - Organics (PAHs and pesticides) may significantly interfere with bonding process. - Fine insoluble material can delay and weaken bonds. - Not consistent with SARA's preference for on-site remedies.	- Significant waste volume necessitates large scale transportation to large landfill to contain solidified material. - Alternative constitutes an "off-site" solution.	- Invasive remedial activities require worker protection and increase costs. - Significant cost for transporting and disposal at a large RCRA landfill.

Protection of Public Health and the Environment:

This alternative offers protection to public health and the environment by reducing potential for direct contact with contaminants. By incorporating waste in a solidified matrix and landfilling the material, the potential for contaminant migration is reduced in two ways. Wastes are also consolidated off-site in one area.

Remedial Action Objectives Achieved:

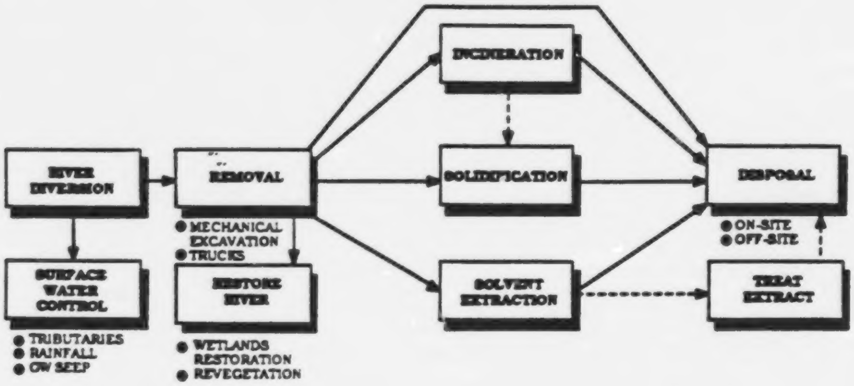
Alternative R-4 achieves the source control remedial action objectives.

Conclusion:

This alternative will be eliminated from further consideration. Rationale for eliminating this alternative includes (1) the statutory preference for on-site remedies rather than off-site disposal; (2) excessive costs associated with off-site disposal of a large volume of material; and (3) other alternatives offer equal or better treatment performance at similar or reduced costs.

SCREENING OF REMOVAL ALTERNATIVES WITH RIVER DIVERSION

COCHATO RIVER SEDIMENT FSS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS



RIVER DIVERSION

Build hydraulic barriers upstream and downstream of stretch of river to be diverted; clear, grub, build gravel road where necessary to provide access for construction activities in areas where access is not provided by on-site remediation activities; install diversion conduits in coordination with on-site excavation activities; backfill around conduits with clean treated soils from on-site treatment process; divert river flow through conduits; reestablish vegetation in areas not common with on-site remediation activities.

EFFECTIVENESS	IMPLEMENTABILITY	COST
Advantages	**Advantages**	**Advantages**
- Potential for contaminant migration via surface water effectively eliminated by river diversion.	- Efficiency and accuracy of contaminated sediment removal increased by river diversion.	- Construction, capital, and O&M costs well defined.
Disadvantages	**Disadvantages**	**Disadvantages**
- River diversion will have a negative impact on the aquatic ecosystem.	- Diversion construction would require close coordination with on-site soil remediation activities. - Complex undertaking; similar benefit could be provided by less complex means. - Location-specific ARARs governing wetlands and floodplains require enhancement, restoration, or creation of wetlands or floodplains destroyed or negatively impacted from the construction of access roads or diversion of the Cochato River.	- Expensive undertaking, similar benefit could be provided by less costly means.

Protection of Public Health and the Environment:

Removal alternatives with river diversion effectively eliminate the potential for containment migration downstream via surface water flow. The aquatic ecosystem will be negatively impacted by removal of flow from river bed.

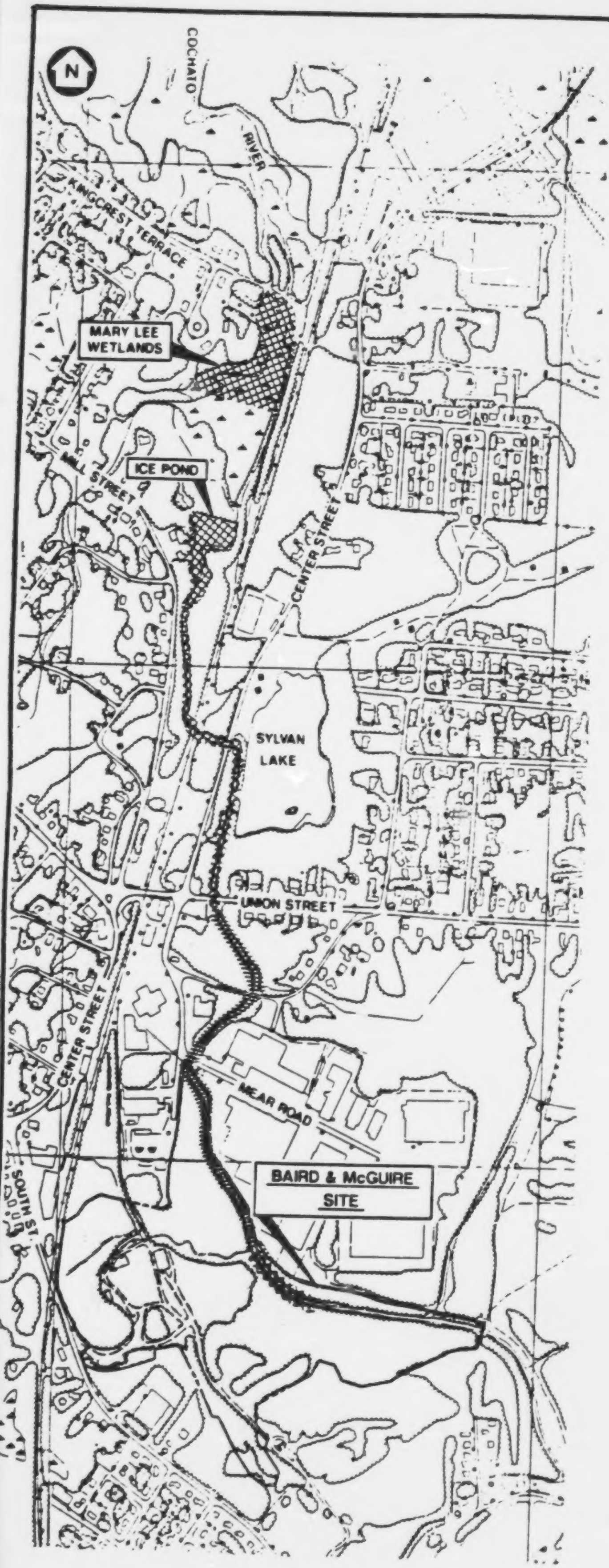
Remedial Action Objectives Achieved:

Removal alternatives with river diversion would achieve remedial action objectives related to potential exposure to risk via containment migration and fail objectives to protect the environment.

Conclusion:

The removal alternatives with river diversion will be eliminated from further consideration because removal alternatives involving no river diversion are feasible, have less impact on aquatic ecosystem, provide similar protection to exposure risks, and are less complex and costly.

FIGURE 3



LEGEND

▤ AREAS REQUIRING REMEDIATION TO MEET PUBLIC HEALTH TARGET LEVELS OF 10^{-5}

▩ AREAS REQUIRING REMEDIATION TO MEET ECOLOGICAL TARGET LEVELS (INCLUDES ALL AREAS REQUIRING REMEDIATION FOR PUBLIC HEALTH)

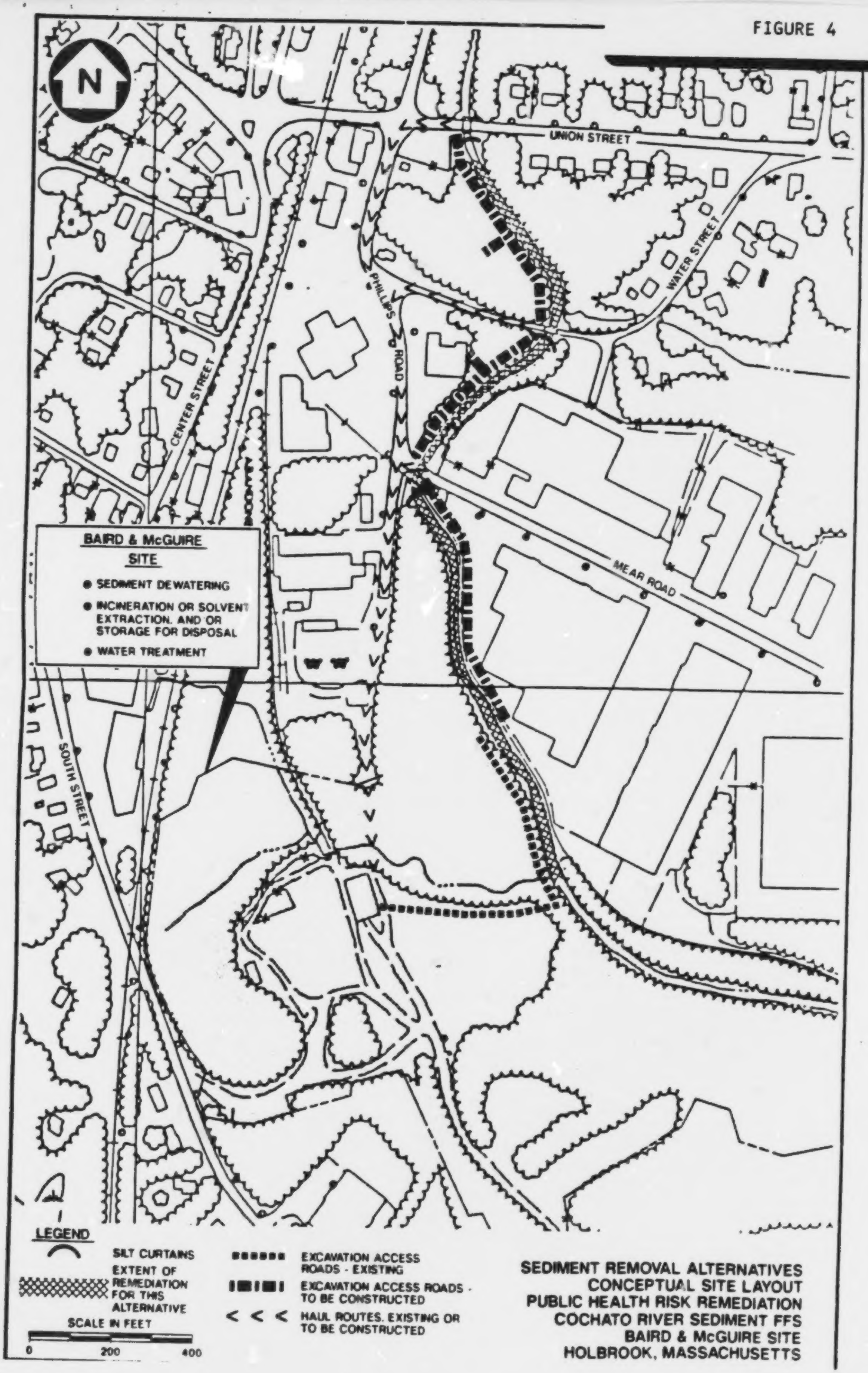
SEDIMENT EXCAVATION VOLUMES

FOR PUBLIC HEALTH RISK REMEDIATION	1200 CUBIC YARDS
FOR ECOLOGICAL RISK REMEDIATION	20,100 CUBIC YARDS

SCALE IN FEET
0 500 1000

REMEDIATION AREAS
COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

FIGURE 4


N
UNION STREET
WATER STREET
PHILLIPS ROAD
CENTER STREET
MEAR ROAD
SOUTH STREET
BAIRD & McGUIRE SITE
● SEDIMENT DEWATERING
● INCINERATION OR SOLVENT EXTRACTION, AND OR STORAGE FOR DISPOSAL
● WATER TREATMENT
LEGEND
SILT CURTAINS
EXTENT OF REMEDIATION FOR THIS ALTERNATIVE
SCALE IN FEET
0
200
400
EXCAVATION ACCESS ROADS - EXISTING
EXCAVATION ACCESS ROADS - TO BE CONSTRUCTED
< < < HAUL ROUTES, EXISTING OR TO BE CONSTRUCTED

SEDIMENT REMOVAL ALTERNATIVES
CONCEPTUAL SITE LAYOUT
PUBLIC HEALTH RISK REMEDIATION
COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

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TABLE 1

DIRECT CONTACT WITH AND/OR INGESTION OF COCHATO RIVER SEDIMENT
CARCINOGENIC EFFECTS
REALISTIC WORST CASE EXPOSURE SCENARIO[1]

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

COMPOUND	MAXIMUM CONCENTRATION (µg/g)	AMOUNT OF SOIL CONTACTED (g/event)	AMOUNT OF SOIL INGESTED (g/event)	DERMAL TK FACTOR	INGESTION TK FACTOR	BODY WEIGHT (kg)	NO. OF EVENTS PER YEAR	NO. OF YEARS EXPOSED	INGESTION BODY DOSE (mg/kg/day)	DIRECT CONTACT BODY DOSE (mg/kg/day)	CAG Potency Factor (mg/kg/day)^-1	INCREMENTAL RISK
Arsenic	4040.0	1.0	0.1	0.00	1.00	45	30	10.0	1.05E-04	0.00E+00	1.50E-01	1.58E-05
PAHs	22.8	1.0	0.1	0.05	1.00	45	30	10.0	1.06E-05	2.97E-07	1.15E+01	1.0E-05
(Carcinogenic)									5.95E-07			
DDT	48.0	1.0	0.1	0.50	1.00	45	30	10.0	1.25E-06	6.26E-06	3.40E-01	2.55E-06
Chlordane	9.1	1.0	0.1	0.50	1.00	45	30	10.0	2.37E-07	1.19E-06	1.30E+00	1.85E-07
									SUMMARY CARCINOGENIC RISK			3.0E-05

NOTES:

TK = Toxicokinetic Factor

This table calculates estimated body doses and incremental carcinogenic risks.

The equations to calculate body dose level and incremental carcinogenic risks are:

$$\underset{(mg/kg/day)}{\text{Body Dose}} = \underset{(ug/g)}{\overset{\text{Soil}}{\text{Concentration}}} \times [(\underset{(g/event)}{\text{Amount Contacted}} \times \text{Dermal TK Factor}) + (\underset{(g/event)}{\text{Amount Ingested}} \times \text{Ingestion TK Factor})]$$

$$\times \frac{1}{\underset{(kg)}{\text{Body Weight}}} \times \frac{\text{No. Events}}{\text{years}} \times \frac{\text{No. of years exposed}}{\text{70 years}} \times \frac{\text{1mg}}{\text{1000 ug}} \times \frac{\text{1 yr}}{\text{365 days}} \quad \text{1000 ug}$$

$$\underset{mg/kg/day}{\text{Incremental Risk}} = \text{Body Dose} \times \underset{(mg/kg/day)^{-1}}{\text{CAG Potency Factor}}$$

[1] Based on maximum contaminant concentrations detected in sediment samples collected during June 1988 and November 1988 sampling events.

DIRECT CONTACT WITH AND/OR INGESTION OF COCHATO RIVER SEDIMENT
CARCINOGENIC EFFECTS
MOST PROBABLE EXPOSURE SCENARIO

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

COMPOUND	AVERAGE CONCENTRATION (µg/g)	AMOUNT OF SOIL CONTACTED (g/event)	AMOUNT OF SOIL INGESTED (g/event)	DERMAL TK FACTOR	INGESTION TK FACTOR	BODY WEIGHT (kg)	NO. OF EVENTS PER YEAR	NO. OF YEARS EXPOSED	INGESTION BODY DOSE (mg/kg/day)	DIRECT CONTACT BODY DOSE : (mg/kg/day)	CAG Potency Factor (mg/kg/day)^-1	INCREMENTAL RISK
Arsenic	31.0	1.0	0.1	0.00	1.00	45	30	10.0	8.09E-07	0.00E+00	1.50E-01	1.2E-07
PAHs (Carcinogenic)	10.2	1.0	0.1	0.05	1.00	45	30	10.0	2.66E-07	1.33E-07	1.15E+01	4.6E-06
DDT	1.2	1.0	0.1	0.50	1.00	45	30	10.0	3.13E-08	1.57E-07	3.40E-01	6.4E-08
Chlordane	1.2	1.0	0.1	0.50	1.00	45	30	10.0	3.13E-08	1.57E-07	1.30E+00	2.4E-07
SUMMARY CARCINOGENIC RISK												5.0E-06

NOTES:

TK = Toxicokinetic Factor

This table calculates estimated body doses and incremental carcinogenic risks.

The equations to calculate body dose level and incremental carcinogenic risks are:

$$\underset{(mg/kg/day)}{\text{Body Dose}} = \underset{(ug/g)}{\overset{\text{Soil}}{\text{Concentration}}} \times \left[\left(\underset{(g/event)}{\text{Amount Contacted}} \times \text{Dermal TK Factor}\right) + \left(\underset{(g/event)}{\text{Amount Ingested}} \times \text{Ingestion TK Factor}\right)\right]$$

$$\times \frac{1}{\underset{(kg)}{\text{Body Weight}}} \times \frac{\text{No. Events}}{\text{years}} \times \frac{\text{No. of years exposed}}{\text{70 years}} \times \frac{\text{1mg}}{\text{1000 ug}} \times \frac{\text{1 yr}}{\text{365 days}} \quad \text{1000 ug}$$

$$\text{Incremental Risk} = \underset{mg/kg/day}{\text{Body Dose}} \times \underset{(mg/kg/day)^{-1}}{\text{CAG Potency Factor}}$$

TABLE 2

TECHNOLOGY SCREENING SUMMARY

COCHATO RIVER SEDIMENT FFS
BAIRD & MCGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	RETAINED	
	YES	NO
No Action/Institutional Action		
• Institutional Controls	X	
• Fencing/Posting	X	
• Environmental Monitoring	X	
Containment		
• Cap In-situ	X	
Removal		
• Mechanical Excavation	X	
• Hydraulic Excavation		X
• Pneumatic Excavation		X
Treatment		
• Acid Leaching		X
• Advanced Biological Treatment Methods		X
• Incineration	X	
• Molten Glass Electric Reactor/Vitrification		X
• Thermal Aeration		X
• Solidification/Stabilization	X	
• In-situ Solidification/Stabilization		X
• In-situ Vitrification		X
• Solvent Extraction	X	
Disposal		
• On-site Disposal	X	
• Off-site RCRA Landfill	X	
• On-site RCRA Landfill		X

(continued)
TECHNOLOGY SCREENING SUMMARY

COCHATO RIVER SEDIMENT FFS
BAIRD & MCGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	RETAINED	
	YES	NO
Ancillary		
• Hydraulic Barriers	X	
• Clearing/Grubbing	X	
• Pumping	X	
• On-site Water Treatment	X	
• Screening	X	
• Dewatering	X	
• Chipping	X	
• Silt Curtains	X	
• Trucking	X	
• Grading	X	
• Revegetation	X	

SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
NO ACTION/INSTITUTIONAL ACTION				
• Institutional Controls	Long-term responsibility for controls uncertain.	None.	Untreated contaminant concentrations left to decrease through natural attenuation.	Retain. Identify parties responsib for institutional controls.
• Fencing/Posting	None.	None.	Not applicable.	Retain. Effectiv institutional control (continue fencing/posting may also be appli as a support tech nology during remedial action).
• Environmental Monitoring	None.	None.	Not applicable.	Retain. Effectiv monitors changes in site condition with time (re- quired when waste remain on-site).
CONTAINMENT				
• Cap In-situ	Large irregular areas to be capped. Permeable cap material would allow groundwater to enter river water through bottom sediments and floodplain wetlands.	Future contaminant leaching not addressed.	Contaminated media capped but remains untreated.	Retain. Address some remedial action objectives

(continued)
SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
Removal				
• Mechanical Excavation	Access roads would be required adjacent to removal areas (source control RD/RA will provide for access to river along Baird & McGuire site).	Mechanical excavation technologies well-suited for effective, efficient removal of contaminated materials.	Would require comparatively little dewatering prior to disposal or treatment.	Retain. Best-suited removal technology for site wastes present.
• Hydraulic Excavation	Insufficient water depths for successful operation; hydraulic dredge action not as easily controlled as mechanical excavators.	Would be necessary to use a cutter-head to loosen gravels and hard-packed sediments for hydraulic lifting, thus increasing potential for contaminant resuspension and migration downstream.	Would require an extensive dewatering procedure prior to disposal and most treatment processes.	Eliminate. Use of hydraulic excavation equipment not feasible for site conditions.
• Pneumatic Excavation	Insufficient water depths for effective operation, smallest production rates of removal technologies.	Sands and gravels difficult to lift at shallow depths.	Often less water is conveyed with pneumatic equipment compared to hydraulic equipment.	Eliminate. Other excavation technologies more effective and easily implementable.

(continued)
SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
TREATMENT				
• Acid-Leaching	Excavation and dewatering of sediments would be required prior to treatment.	Arsenic not effectively leachable under acidic conditions, would not address pesticide or PAHs contamination.	Corrosive leachate would require treatment (neutralization) prior to disposal.	Eliminate. Not effective for contaminants of concern.
• Advanced Biological Treatment Methods	Excavation and dewatering would be required prior to treatment.	Not effective on low concentrations of PAHs or arsenic present. Pesticides may be toxic to microorganisms.	Potential for waste residuals to be of same concentration as untreated waste feed.	Eliminate. Not effective for inorganics, effectiveness on organics compounds uncertain. Response objectives may not be satisfied.
• Incineration	Excavation and dewatering required.	Incineration would destroy organics but may leave inorganic constituents untreated.	Ash from incineration may require secondary waste management for inorganics. Arsenic compounds may be present in flue gases or bottom ash and would require further treatment.	Retain. Accomplishes reduction in sediment volum and toxicity.

(continued)
SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
• Molten Glass Electric Reactor/ Vitrification	Moisture content adversely affects flow rate of process. Extensive dewatering of excavated sediment required.	Will require long-term management for potential contaminant leaching.	Organics volatilized; inorganics encapsulated in dense vitrified mass with low leachability would require disposal.	Eliminate. Has advantage over other more well-developed therma oxidation technologies; not ye demonstrated on a full-scale operation.
• Thermal Aeration	Excavation required.	Aeration would not treat inorganic compounds; potentially ineffective on large PAH compounds and carcinogenic pesticides due to low vapor pressure.	VOC/SVOC off-gases.	Eliminate. Fail to treat inorga contaminants, D and carcinogeni PAHs present.
• Solidification/ Stabilization	Excavation required.	Vendors claim success on inorganics and some organics.	Solidified/ stabilized wastes require disposal; contaminants incorporated into solidified matrix may leach over time.	Retain. Addres some remedial action objectiv could be used i conjunction wit other treatment technologies.

(continued)
SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
• In-situ Solidification	In-situ application likely to require permanent river diversion; groundwater discharge will keep potentially contaminated water ponded/flowing through this area.	Intimate mixing of reagents with contaminated sediment may be difficult; effectiveness on pesticides/PAHs must be determined by treatability tests.	Solidified sediments requiring cap to minimize infiltration in order to reduce potential for long-term leaching of contaminants.	Eliminate. Site conditions not favorable for application of in-situ solidification technology in streambed due to groundwater discharge in streambed.
• In-situ Vitrification	Cannot be performed in subaqueous conditions; would require hydraulic barrier for both surface and groundwater; vitrified areas would require significant time to cool-cover would be necessary	Organics are thermally destroyed inorganics are immobilized within glass. This system operates most efficiently on soils with low moisture and high silica content, Cochato River sediments typically exhibit high moisture, high organics, and low silica contents.	None.	Eliminate. Site conditions not appropriate for in situ application of this technology. Excavation and removal of sediment more feasible and implementable than dewatering river bed and in-situ vitrification.

(continued)

SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
• Solvent Extraction	Excavation required.	Effective in reducing the volume of the contaminated substance; several steps may be required for lower contaminant concentrations and to remediate both organic and inorganic contaminants; most effective on low-moisture content, low-plasticity soils with contaminants that are not tightly bound to soil grains.	Concentrated waste stream of extracted organics require aqueous phase treatment; process economies requires extractant recycling.	Retain. Addresse some remedial action objectives
DISPOSAL				
• On-site RCRA Landfill	Special considerations may be required to construct landfill on-site.	Volume and handleability of high organic content sediment	Leachate from landfill.	Eliminate. EPA source control ROD (1986) precludes this disposal option.
• On-site Disposal (Baird & McGuire site)	Special considerations may be required to dispose at the Baird & McGuire site.	None.	Potential leachate from disposal.	Retain. Potenti disposal technology if used in conjunction with treatment method for wastes passing TCLP.

(continued)
SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
• Off-site RCRA Landfill	Capacity and location of existing off-site RCRA landfills.	Ability to store and transport substantial volume.	Not applicable.	Retain. Assess cost for transporting and landfilling waste or treat material off-site.
ANCILLARY				
• Hydraulic Barriers (dikes, levees, canals, culverts, conduits)	None.	None.	Not applicable.	Retain. May be temporary or permanent; may be used in conjunction with other technologies.
• Clearing/Grubbing	Heavily-wooded site requires clearing and grubbing to improve existing access to river; ongoing source control RD/RA includes significant amount of clearing/grubbing at the Baird & McGuire site.	None.	Wood chips, stumps, and logs will require disposal.	Retain. Clearin grubbing necessa for site preparations prior to remedial construction.
• Surface Water Pumping	None.	Potential for substantial volume of surface water from rainfall tributaries and groundwater discharge.	Water requires treatment.	Retain. Initial activity prior t excavating.

(continued)

SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
• On-site Water Treatment	At present being designed according to 1986 source control ROD.	Potential for substantial volume of surface water from rainfall tributaries and groundwater discharge requiring treatment.	Sludge.	Retain. Ponded water would be pumped from riverbed prior to excavation or covering; may be necessary in conjunction with hydraulic barriers.
• Screening	None.	Basic screening likely to be necessary to avoid damaging treatment units.	May require further handling to incorporate into waste stream.	Retain. Necessary for several treatment technologies.
• Dewatering	None.	Excavated contaminated sediment may require dewatering activities, depending on treatment and/or disposal scenario selected.	Water requiring appropriate treatment.	Retain. Potentially necessary for treatment/ disposal technologies.
• Chipping	None.	Wood and other solid waste in river area will require separation/screening before chipping solid waste.	Not applicable.	Retain. Necessar support technolog to manage solid waste.

(continued)

SCREENING OF SEDIMENT TECHNOLOGIES

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

TECHNOLOGY	SITE-LIMITING CHARACTERISTICS	WASTE-LIMITING CHARACTERISTICS	WASTE RESIDUALS	STATUS
• Silt Curtains	None.	None.	Not applicable.	Retain. Useful for temporary control of migration of suspended sediments.
• Trucking	Access roads required, on-going source control RD/RA provides access for on-site portions adjacent to river.	Substantial waste volume requires trucks to transport waste.	Not applicable.	Retain. Necessar support technolog for off-site land disposal and on-site treatment.
• Grading (river access areas)	Heavily wooded site requires clearing/grubbing to open access for grading equipment. On-site source control RD/RA will provide equipment access to river adjacent to Baird & McGuire site.	None.	Not applicable.	Retain. Likely t be necessary for some access areas after remedial activities.
• Revegetation (river access areas, wetlands)	Complete restoration may take several years. On-site source control RD/RA will do wetlands restoration at Baird & McGuire site.	None.	Not applicable.	Retain. Likely t be necessary for some access areas after remedial activities.

TABLE 3

REMEDIAL ALTERNATIVE SCREENING SUMMARY

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

ALTERNATIVE		RETAINED FOR FURTHER EVALUATION	ELIMINATED FROM FURTHER CONSIDERATION
NR-1	No-Action	X	
NR-2	Institutional Action	X	
NR-3	In-situ Containment	X	
RD-NR-1	River Diversion/No-Action		X
RD-NR-2	River Diversion/Institutional Action		X
RD-NR-3	River Diversion/In-situ Containment		X
R-1	Removal/Disposal	X	
R-2	Removal/Incinerate/Disposal	X	
R-3	Removal/Solvent Extract/Disposal	X	
R-4	Removal/Solidify/Disposal		X
RD-R-1	River Diversion/Removal/Disposal		X
RD-R-2	River Diversion/Removal/Incinerate		X
RD-R-3	River Diversion/Removal/Solvent Extract		X
RD-R-4	River Diversion/Removal/Solidify		X

TABLE 4

PUBLIC HEALTH TARGET LEVELS FOR CONTAMINANTS OF CONCERN

COCHATO RIVER SEDIMENT STUDY
BAIRD & MCGUIRE SITE
HOLBROOK, MASSACHUSETTS

COMPOUND	TARGET LEVEL[1] (10^{-5} RISK) (ppm)	TARGET LEVEL[1] (10^{-6} RISK) (ppm)
Arsenic	2500	250
PAHs	22	2.2
DDT	190	19
Chlordane	50	5.0

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[1] These concentrations correspond to the indicated risk based on exposure to a single compound and do not assume concurrent exposure with other contaminants.

TABLE 5

TARGET LEVELS FOR SAMPLING LOCATIONS REQUIRING REMEDIATION DUE TO ENVIRONMENTAL RISK

COCHATO RIVER SEDIMENT STUDY
BAIRD & MCGUIRE SITE
HOLBROOK, MASSACHUSETTS

SAMPLE	TARGET LEVEL (mg/kg)	TARGET COMPOUND[2]	TARGET LEVEL CALCULATION BASIS
SD-107-2	1.030	Phenanthrene	SQC[1]
SD-107-3	0.417	Phenanthrene	SQC
SD-110-1	0.252	Phenanthrene	SQC
SD-111-1	0.539	DDT	SQC
SD-111-2	0.118	DDT	SQC
SD-112-1	0.022	DDT	SQC
SD-112-2	0.009	DDT	SQC
SD-112-3	0.071	DDT	SQC
SD-113-1	0.190	DDT	SQC
SD-113-2	0.028	DDT	SQC
SD-113-3	0.051	DDT	SQC
SD-114-1	0.439	DDT	SQC
SD-114-2	0.066	DDT	SQC
SD-115-1	0.457	DDT	SQC
SD-115-DUP	0.309	DDT	SQC
SD-115-2	0.246	DDT	SQC
SD-115-3	0.152	DDT	SQC
SD-116-1	0.004	DDT	SQC
SD-116-2	0.356	DDT	SQC
SD-117-1	0.378	DDT	SQC
SD-117-2	0.060	DDT	SQC
SD-120-DUP	0.536	DDT	SQC
SD-120-2	0.670	DDT	SQC
SD-121	0.053	Chlordane	SQC
SD-122-1	0.922	DDT	SQC
SD-124-1	0.798	DDT	Upper CIV[3]
SD-124-2	0.760	DDT	Upper CIV
SD-125-1	1.379	DDT	Upper CIV
SD-125-2	0.927	DDT	Upper CIV

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[1] Sediment Quality Criterion
[2] DDT = DDT and metabolites (DDD and DDE)
[3] Upper CIV = Upper Confidence Interval Value

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TABLE 6

COMPARATIVE SUMMARY OF COCHATO RIVER SEDIMENT REMEDIAL ALTERNATIVES

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

CRITERIA	NR-1 NO-ACTION	NR-2 INSTITUTIONAL ACTION	NR-3 IN-SITU CONTAINMENT	R-1 REMOVAL AND DISPOSAL	R-2 INCINERATION	R-3 SOLVENT EXTRACTION
1. SHORT-TERM EFFECTIVENESS						
Protection of Community During Remedial Action	No additional increase over present risks would be posed.	No increase over present risks would be posed.	No increase over present risks would be posed.	Potential dermal contact threats to public inherent with excavation and transportation of contaminated sediments over public roads. Risks minimized by implementation of approved work and health & safety plans. Dust exposure not expected as sediment is moist.	Potential air impacts controlled by emissions control devices.	Possible nuisance odor problem associated with solvent extraction process.
Protection of Workers During Remedial Action	No additional increase over present risks would be posed.	No additional increase over present risks would be posed.	Personal protective equipment would control dermal exposure pathway; respiratory protection not expected due to subaqueous cap installation.	Personal protective equipment would control dermal and inhalation exposure pathways during excavation, transportation, and dewatering activities.	Personal protective equipment would control dermal and inhalation exposure pathways during excavation, transportation, dewatering, and incineration (and solidification if necessary) operations.	Personal protective equipment would control dermal and inhalation exposure pathways during excavation, transportation, and solvent extraction activities.
Environmental Impacts From Remedial Actions	Contaminants would remain in the sediment of the Cochato River; no additional impacts.	Contaminants would remain in the sediment of the Cochato River; minimal impacts due to fence construction.	Exposure risk would be mitigated but wetlands and benthic habitat would be destroyed.	Removal would mitigate risks to public and future benthic biota but would disrupt wetlands, aquatic and benthic habitats in process.	Removal and treatment would mitigate risks to public and future benthic biota but would disrupt wetlands, aquatic and benthic habitats in process.	Removal and treatment would mitigat risks to public an future benthic biot but would disrupt wetlands, aquatic and benthic habita in process.

(continued)
COMPARATIVE SUMMARY OF COCHATO RIVER SEDIMENT REMEDIAL ALTERNATIVES

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

CRITERIA	NR-1 NO-ACTION	NR-2 INSTITUTIONAL ACTION	NR-3 IN-SITU CONTAINMENT	R-1 REMOVAL AND DISPOSAL	R-2 INCINERATION	R-3 SOLVENT EXTRACTION
Time Until Remedial Action Objectives Achieved	Fails to achieve sediment remedial action objectives.	Fails to achieve sediment remedial action objectives.	Reduces potential for direct contact; objectives could be achieved in 6 months.	Remedial action objectives achieved; excavation would take approximately 3 months to complete, but sediment removal timing subject to on-site source control remedial activity schedule.	Remedial action objectives achieved; excavation would take approximately 3 months to complete, but sediment removal timing subject to on-site source control remedial activity schedule.	Remedial action objectives achieved excavation would take approximately 3 months to complet but sediment remova timing subject to on-site source control remedial activity schedule.
2. LONG-TERM EFFECTIVENESS						
Magnitude of Residual Risk	Risks would remain as at present.	Potential for contaminant migration via surface water flow not addressed.	Exposure risks to contaminated sediment would be minimal as long as cap integrity is maintained.	Minimal residual risk in off-site RCRA landfill.	Residual materials from incineration process likely to be hazardous and would require appropriate management (solidification); however, wastes consolidated at Baird & McGuire site and easily managed.	Residual risk may remain should treatment fail to achieve extraction level; however, wastes would be consolidated at Baird & McGuire site and easily managed.
Adequacy of Controls to Manage Residuals	No additional controls would be provided; security fence around Baird & McGuire site would remain; downstream-contaminated areas would remain unfenced.	Long-term risk remains; potential for human exposure required.	The multilayer cap would reduce dermal exposure and would adequately minimize potential contaminant migration via surface water flow.	RCRA landfill offers adequate controls to management long-term risk; leachate collection system installed in landfill.	Residual management controls for incineration well developed.	Solvent extraction process control requirements difficult to define
Reliability of Controls - Protection from Residuals	No additional controls would be provided; security fence around Baird & McGuire site would remain; downstream-contaminated areas would remain unfenced.	Relies solely on fence and institutional controls to prevent exposure; residual risk would remain high.	Cap is anticipated to remain intact for 30 years after which integrity is questionable.	RCRA landfill is a reliable technology; no further controls would be necessary.	Incineration is a well-demonstrated reliable treatment technology for organic contaminants; solidification of hazardous inorganic residuals reliable.	Reliability of solvent extraction technology uncertain.

(continued)

COMPARATIVE SUMMARY OF COCHATO RIVER SEDIMENT REMEDIAL ALTERNATIVES

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

CRITERIA	NR-1 NO-ACTION	NR-2 INSTITUTIONAL ACTION	NR-3 IN-SITU CONTAINMENT	R-1 REMOVAL AND DISPOSAL	R-2 INCINERATION	R-3 SOLVENT EXTRACTION
3. REDUCTION OF MOBILITY, TOXICITY, AND VOLUME	No reductions in mobility, toxicity, and volume since no treatment is involved.	No reductions in mobility, toxicity, and volume since no treatment is involved.	No reduction in mobility, toxicity, and volume, since no treatment is involved; cover makes contaminants less accessible only.	Contaminant accessibility reduced through excavation and RCRA landfilling; no reduction in toxicity, mobility, or volume realized, since no treatment is involved.	Incineration reduces toxicity, mobility, and volume of sediment and destroys organic constituents. Inorganic contaminant mobility and toxicity may be increased and residual material would require secondary waste management.	Contaminant accessibility reduced through excavation and consolidation; solvent extraction process would decrease contaminated material mobility, toxicity, and volume, but would generate other contaminated media that would require treatment.
4. IMPLEMENTABILITY						
Technical Feasibility	Five-year review necessary.	Fence readily constructible; five-year review necessary.	Cover system readily constructible with standard construction activities; five-year review necessary.	Excavation, transportation, dewatering, water treatment and off-site disposal easily implementable.	Technology demonstrated for organics; questionable for treatment of inorganics; stack monitoring necessary.	Solvent extraction process not proven for contaminated material matrix; would require proce development througl treatability testing.
Administrative Feasibility	No permits required.	Legal services for institutional controls necessary.	No permits necessary; institutional controls would be necessary to preserve cap integrity.	Transportation and disposal permits necessary for off-site RCRA landfilling.	No permits necessary; requires coordination with on-site source-control remedial contractor for incineration and water treatment operations.	No permits necessary; treatme process could operate independently of on-site treatment activities.

(continued)
COMPARATIVE SUMMARY OF COCHATO RIVER SEDIMENT REMEDIAL ALTERNATIVES

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

CRITERIA	NR-1 NO-ACTION	NR-2 INSTITUTIONAL ACTION	NR-3 IN-SITU CONTAINMENT	R-1 REMOVAL AND DISPOSAL	R-2 INCINERATION	R-3 SOLVENT EXTRACTION
Availability of Equipment and Materials	No equipment or materials necessary.	Services, equipment, and materials available locally.	Services, equipment, and materials available locally.	Excavation, transportation, and dewatering equipment, services, and materials available regionally.	Same as R-1. In addition, incinerator and water treatment plant provided by on-site source-control activity.	Same as R-1. In addition, mobile solvent extraction unit available regionally.
5. COST PH/E **						
Construction Cost	$0	$88K	$145K/$2.3M	$1.2M/18.2M	$1.0M/$16M	$1.8M/$16M
O&M (annual)	$0	$484K	$560K/$870K	$0	$0	$0
Five-year Review Costs	$28,000	$56K	$56K/$56K	$0	$0	$0
Present Worth (Total Cost)	$28,000	$628K	$761K/$3.2M	$1.2M/18.2M	$1.0M/$16M	$1.8M/16M
6. COMPLIANCE WITH ARARS	Does not meet goals or intent of CERCLA/SARA or the NCP for a permanent remedy; chemical-specific ARARs not achieved.	Does not meet goals or intent of CERCLA/SARA or the NCP for a permanent remedy; chemical-specific ARARs not achieved.	Does not meet goals or intent of CERCLA/SARA or the NCP for a permanent remedy; chemical-specific ARARs not achieved.	Off-site land disposal without treatment, least favored action under CERCLA/SARA; removal actions would trigger location-specific ARARs.	Meets goals and intent of CERCLA/SARA and NCP; meets chemical-specific ARARs; meets or justifies waiver of action-specific ARARs for incineration of hazardous wastes; removal actions would trigger location-specific ARARs.	Meets goals and intent of CERCLA/SARA and the NCP; meets action-specific ARARs for miscellaneous unit under RCRA; remova actions would trig location-specific ARARs.
7. OVERALL PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT	No protection of public health or environment over existing conditions other than through natural degradative and dispersal processes.	Minimal protection to public health provided by fence and institutional controls; no protection of environment over existing conditions other than through natural degradative processes.	Contaminated sediment remains but exposure significantly reduced.	Public health risks significantly reduced; environmental impacts addressed.	Public health risks significantly reduced; environmental impacts addressed.	Public health risk significantly reduced; environmental impacts addressed.

** Costs listed here do not include the addition of 300 cubic yards of sediment, nor the addition of monitoring. Please see the ROD for a discussion of the cost of each alternative.

(continued)

COMPARATIVE SUMMARY OF COCHATO RIVER SEDIMENT REMEDIAL ALTERNATIVES

COCHATO RIVER SEDIMENT FFS
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

CRITERIA	NR-1 NO-ACTION	NR-2 INSTITUTIONAL ACTION	NR-3 IN-SITU CONTAINMENT	R-1 REMOVAL AND DISPOSAL	R-2 INCINERATION	R-3 SOLVENT EXTRACTION
8. STATE ACCEPTANCE	To be incorporated into the ROD.					
9. COMMUNITY ACCEPTANCE	To be incorporated into the Responsiveness Summary of the ROD.					

TABLE 7

CONTAMINATED SEDIMENT EXCAVATION VOLUME ESTIMATE[1]

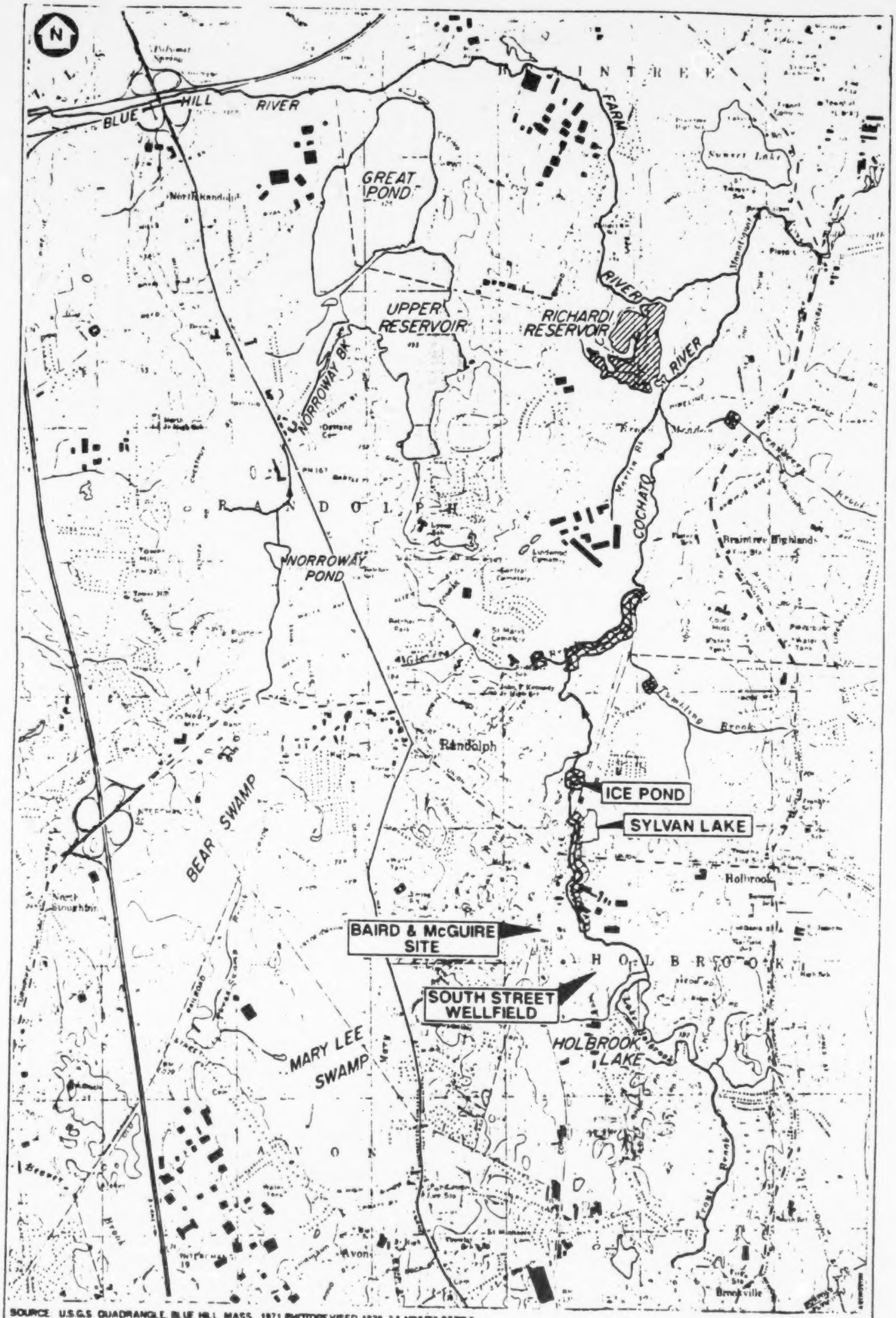
COCHATO RIVER SEDIMENT STUDY
BAIRD & MCGUIRE SITE
HOLBROOK, MASSACHUSETTS

SAMPLING LOCATIONS	SEDIMENT EXCAVATION VOLUME (cy) BASED ON REMEDIATION TO: PUBLIC HEALTH TARGET LEVELS CORRESPONDING TO 10^{-5}	PUBLIC HEALTH TARGET LEVELS CORRESPONDING TO 10^{-6}
SD-107/108/109	--	--
SD-110/111	200	200
SD-112	300	300
SD-113/114	325	325
SD-115	375	375
SD-116	--	875
SD-117	--	425
SD-120	--	--
SD-121	--	
SD-122	--	775
SD-124/125/126	--	2,250
SD-130	--	750
SD-133/134	--	1,025
TOTAL VOLUME	1200 **	7,325

[1] Volume estimated by multiplying calculated in-place contaminated sediment volume by 1.5 to account for over-excavation and bulking of sediment during excavation.

[2] Public health target levels for contaminants of concern are listed in Table 1.

** Note that this volume does not include the addition of 300 cubic yards of sediment from area SD-116. Please see the ROD for a discussion of this increase, for a total of 1,500 cubic yards of sediment for removal.



SOURCE: U.S.G.S. QUADRANGLE, BLUE HILL, MASS., 1971 PHOTOREVISED 1979, 7.5 MINUTE SERIES

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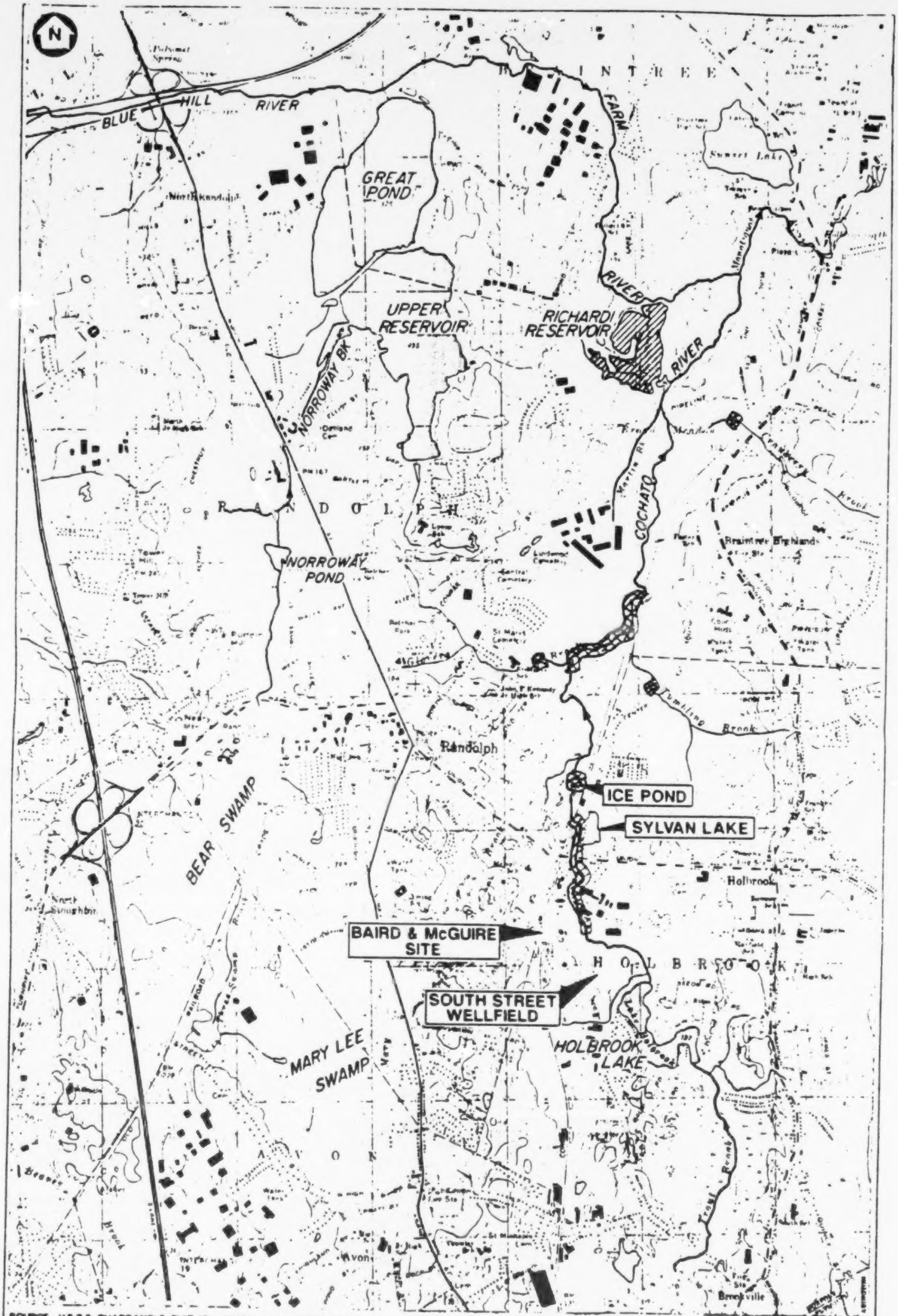
SITE LOCATION MAP
COCHATO RIVER SEDIMENT FFS
BAIRD AND McGUIRE SITE
HOLBROOK, MASSACHUSETTS



SOURCE: U.S.G.S. QUADRANGLE, BLUE HILL, MASS., 1971 PHOTOREVISED 1979 7.5 MINUTE SERIES

SITE LOCATION MAP
COCHATO RIVER SEDIMENT FFS
BAIRD AND McGUIRE SITE
HOLBROOK, MASSACHUSETTS

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TABLE 8

POTENTIAL CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
Surface Water				
Federal Regulatory Requirements	SDWA - MCLs (40 CFR 141.11 - 141.16)	Relevant and Appropriate	Maximum contaminant levels (MCLs) have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	When the risks to public health due to consumption of surface water were assessed, concentrations of contaminants of concern were compared to federal MCLs.
	SDWA - MCLGs (40 CFR 141.50 - 141.51)	Relevant and Appropriate	MCLGs are health-based criteria that are used for the protection of drinking water sources as a result of SARA. These unenforceable goals are available for a number of organic and inorganic contaminants.	MCLGs will be used when an extraordinary risk is associated with contaminants in the Cochato River surface water and sediment.
	Federal Ambient Water Quality Criteria (AWQC)	Relevant and Appropriate	Remedial actions involving contaminated surface water or groundwater must consider the uses of the water and the circumstances of the release or threatened release; this determines the relevance and appropriateness.	This requirement will be considered when determining clean-up levels or potential discharge limits.
State Regulatory Requirements	Massachusetts Drinking Water Standards (310 CMR 22.00)	Relevant and Appropriate	Massachusetts adopted the federal SDWA Maximum Contaminant Levels (MCLs) as its drinking water standards. MCLs regulate the concentration of contaminants in public drinking water supplies.	When risks to public health due to consumption of surface water were assessed, concentrations of contaminants of concern were compared to to Massachusetts MCLs.
	Massachusetts Surface Water Quality Standards (314 CMR 4.00)	Applicable	Surface water quality standards are specified for the major surface water bodies of the Commonwealth. Surface waters are classified with respect to designated uses. Each class of surface water has a criteria associated with it (e.g., dissolved oxygen, temperature, pH, total coliform).	The Cochato River is designated as a Class B River. Actions will take into account the designated use(s) and will comply with specified water quality standards.
Air	Massachusetts Air Pollution Control Regulations (310 CMR 6.04)	Relevant and Appropriate	Massachusetts has promulgated ambient air quality standards for six pollutants (e.g., sulfur oxides, particulate matter, carbon, ozone, nitrogen, and lead).	During excavation activities these standards will complied with.

POTENTIAL CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
Criteria, Advisories, and Guidance				
Federal	EPA Reference Doses (RfDs)	To Be Considered	RfDs are dose levels developed by EPA for noncarcinogenic effects for lifetime exposure.	These criteria were considered during the risk assessment.
	EPA Carcinogen Assessment Group Potency Factors	To Be Considered	Cancer Potency Factors are developed by the EPA from Health Effects Assessment (HEA) (EPA, 1985), or evaluation by Carcinogen Assessment Group (CAG) (EPA, 1985).	These criteria were considered during the risk assessment.
	Acceptable Intake - Chronic (AIC) and Subchronic (AIS) - EPA Health Assessment Documents	To Be Considered	AIC and AIS values are developed from RfDs and HEAs for noncarcinogenic compounds.	These criteria were considered during the risk assessment.
	EPA Office of Water Guidance, Water-Related Fate of 129 Priority Pollutants (1979).	To Be Considered	This guidance manual gives transport and fate information for 129 priority pollutants.	These criteria were considered during the risk assessment.
	EPA Office of Drinking Water, Health Advisories	To Be Considered	Health Advisories are estimates of risk due to consumption of contaminated drinking water.	These criteria were considered during the risk assessment.
	American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values (TLV), Time Weighted Averages (TWAs), and Short Term Exposure Limits (STELs).	To Be Considered	TLVs-TWAs and TLV-STELs are issued as consensus standards for controlling air quality in workplace environments.	These criteria were considered during the risk assessment.

(continued)
POTENTIAL CHEMICAL-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
	EPA future Interim Sediment Criteria Values for Nonpolar Hydrophobic Organic Contaminants (SCD No. 17; May 1988)	To Be Considered	These criteria have been recently developed by EPA for 16 organic compounds. These criteria represent levels protective of aquatic life.	These criteria were used to generate sediment quality criteria values during the risk assessment.
State				
	Massachusetts Drinking Water Health Advisories	To Be Considered	DEQE Health Advisories are guidance criteria for drinking water.	These advisories were considered during the risk assessment.
	Massachusetts Guidance on Allowable Ambient Levels (AALs), cited in Chemical Health Effects Assessment Methodology and Methodology to Derive Allowable Ambient Levels. Draft, DEQE, 1987.	To Be Considered	This guidance evaluates acute and chronic toxicity and sets draft AALs for 106 chemicals. Final AALs will be issued in 1989.	These levels will be considered when evaluating excavation and treatment technologies that have potential hazardous air emissions.

CHEMICAL-SPECIFIC ARARS
CRITERIA, ADVISORIES, AND GUIDANCE
FOR CONTAMINANTS OF CONCERN

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

	SDWA[1]		Massachusetts MCL[2] (mg/ℓ)	CWA-AWQC[3]		RfD[4] (mg/kg/day)	CPF[5] (mg/kg/day)	Sediment Criteria[6] Mean Values (μg/gC)
	MCLs (mg/ℓ)	MCLGs (mg/ℓ)		Acute (μg/ℓ)	Chronic (μg/ℓ)			
Arsenic	0.50		0.050	850 (pentavalent) 360 (trivalent)	48 190	$1.0\text{x}10^{-3}$	$1.75\text{x}10^{-1}$	
Chlordane			0.00005[7]	2.4	0.0043		1.3	
DDT				1.1	0.001		$3.4\text{x}10^{-10}$	0.828
PAHs[8] (Phenanthrene)							$1.15\text{x}10^{+1}$	139.0

NOTES:

[1] EPA Safe Drinking Water Act National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) and MCL Goals. Source: 40 CFR 141.

[2] Massachusetts Department of Environmental Quality Engineering Maximum Contaminant Levels. Source: 310 CMR 22.0.

[3] EPA Clean Water Act Ambient Water Quality Criteria for the protection of aquatic organisms. Summarized in: Quality Criteria for Water, 1986; EPA 440/5-86-001.

[4] EPA Reference Dose Response for noncarcinogens. Source: EPA Integrated Risk Information System (IRIS) online database.

[5] EPA Carcinogenic Assessment Group Cancer Risk Potency estimates. Source: IRIS online database.

[6] Interim Sediment Quality Criteria Values for Nonpolar Hydrophobic Organic Contaminants, EPA Office of Water Regulations and Standards Division, May 1988; SCD #17.

[7] Massachusetts Groundwater Protection Standards. Source: 314 CMR 6.07.

[8] Polycyclic Aromatic Hydrocarbons; values given for Phenanthrene.

TABLE 9

POTENTIAL LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

SITE FEATURE	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
Wetlands				
Federal Regulatory Requirements	CWA - Section 404	Applicable	Under this requirement, no activity (discharge of dredge or fill material) that adversely affects a wetlands shall be permitted if a practicable alternative with lesser effects is available. Permits are required to be obtained from the U.S. Army Corps of Engineers for dredge and fill activities in off-site wetlands.	During the identification, screening, and evaluation of alternatives, the impacts of discharges of dredge and fill material to the Cochato River are evaluated. The MEPA Office will receive copies of reports generated during the evaluation and selection of a remedial alternative.
	Fish and Wildlife Coordination Act (16 U.S.C. 661)	Applicable	This act requires that any federal agency proposing to modify a body of water must consult with the U.S. Fish and Wildlife Services.	Requirement addressed under CWA Section 404.
	National Environmental Policy Act (42 U.S.C. 4321; 40 CFR Part 6)	Applicable	Sets forth EPA policy for carrying out the provisions of the Wetlands Executive Order (EO 11990).	This requirement will be considered during the development of alternatives.
	Wetlands Executive Order (EO 11990)	Applicable	Under this order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands.	Many of the requirements of this EO will be addressed under CWA Section 404. Any remaining requirements will also be considered during the identification, screening, and evaluation of alternatives.
State Regulatory Requirements	Massachusetts Environmental Policy Act (MEPA) Regulations (301 CMR 11.00)	Applicable	These regulations require that all exceeding specified thresholds established under MEPA, requiring funding, or requiring a major permit, prepare and file an Environmental Notification Form (ENF). MEPA has determined that the reports generated during Baird & McGuire investigations essentially constitute an Environmental Impact Report.	During development of alternatives impacts to wetlands and floodplains will be evaluated.

SITE FEATURE	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
Wetlands (continued)				
	Wetlands Protection (310 CMR 10.00)	Applicable	Pursuant to these regulations, DEQE and the local conservation commission have the ability to control and limit development so the significant environmental areas (as outlined in 310 CMR 10.02) will not be adversely affected. Areas protected by the act are vegetated wetlands and landforms, land under bodies of water, and land subject to tidal action, coastal storm flowage, or flooding. Any activity proposed within one of these areas must file a Notice of Intent (NOI) with the Municipal Conservation Commission and obtain a final Order of Condition before proceeding with the activity.	Remedial actions with associated impacts to wetlands will be reviewed by the local Conservation Commission and Orders of Condition complied with.
	Department of Environmental Management (DEM) Inland Wetland Orders (302 CMR 6.00)	Applicable	Pursuant to these regulations, DEM has authority to adopt orders restricting activities or uses of inland wetlands in order to preserve and promote public safety, property, wildlife and water resources, and floodplain areas.	DEM will be appraised of remedial actions which may impact inland wetlands.
Floodplains				
Federal Regulatory Requirements	RCRA - Location Standards (40 CFR 264.18)	Relevant and Appropriate	A facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous wastes by a 100-year flood.	Impacts of the construction and operation from on-site hazardous waste treatment, storage or disposal facility on the floodplain must be considered during the development of remedial alternatives.
	National Environmental Policy Act (42 U.S.C. 4321; 40 CFR Part 6)	Applicable	This requirement sets forth the policy and guidance for carrying out the provisions of the Floodplain Executive Order (EO 11988).	NEPA will be considered during the development of alternatives.
	Floodplain Executive Order (EO 11988)	Applicable	This order requires federal agencies to minimize potential harm to or within floodplains and to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains.	The requirements of this EO will be considered during the identification, screening, and evaluation of alternatives.

(continued)
POTENTIAL LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

SITE FEATURE	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
Floodplains (Continued)				
State Regulatory Requirements	Massachusetts Hazardous Waste Management Rules, Facility Location Regulations (310 CMR 30.700-30.707)	Relevant and Appropriate	No new facility may be located in an area subject to flooding, within the watershed of class A or class SA segment of a surface water body (unless DEQE determines these is no feasible alternative), on land overlying an actual planned, or potential public or private drinking water source, or in the flow path of groundwater supplying water to an existing well. Variances and exceptions are noted in the regulations.	The impact of the construction and operation of an on-site hazardous waste treatment, storage or disposal facility on the floodplain must be considered during the development of remedial alternatives.
	Massachusetts Environmental Policy Act (MEPA) Regulation (301 CMR 11.00)	Applicable	These regulations require that all activities exceeding specified thresholds established under MEPA, requiring funding, or requiring a major permit, prepare and file an Environmental Notification Form (ENF). The Secretary of Environmental Affairs has determined that the reports generated during Baird & McGuire investigations essentially constitute an Environmental Impact Report.	During development of alternatives impacts to wetlands and floodplains will be evaluated. The MEPA Office will receive copies of reports generated during the evaluation and selection of a remedial alternative.
	Wetlands Protection (310 CMR 10.00)	Applicable	Pursuant to these regulations, DEQE and the local conservation commission have the ability to control and limit development so the significant environmental areas (as outlined in 310 CMR 10.02) will not be adversely affected. Areas protected by the act are vegetated wetlands and landforms, land under bodies of water, and land subject to tidal action, coastal storm flowage, or flooding. Any activity proposed within one of these areas must file a Notice of Intent (NOI) with the Municipal Conservation Commission and obtain a final Order of Condition before proceeding with the activity.	Remedial actions with associated impact wetlands will be reviewed by the local Conservation Commission and Orders of Condition complied with.
	DEM Inland Wetland Orders (302 CMR 6.00)	Applicable	Pursuant to these regulations, DEM has authority to adopt orders restricting activities or uses of inland wetlands in order to preserve and promote public safety, property, wildlife and water resources, and floodplain areas.	DEM will be apprised of remedial actions that may impact inland wetlands.

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

SITE FEATURE	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FFS
Floodplains (Continued)				
	Waterways Regulation Program (310 CMR 9.00)	Applicable*	Any placement of structures and fill, changes in use of existing licensed structures and fill, and dredging in state waterways must be reviewed and permitted by DEQE (i.e., MGL C.91 Waterways License).	A Chapter 91 License will be obtained from DEQE for any activity in the Cochato River that is regulated by the Waterways Program.
	Certification for Dredging, Dredged Material Disposal and Filling in Waters (314 CMR 9.00)	Applicable	A water quality certification is required for any activity that involves dredging in a waterway or wetland in Massachusetts that is also subject to a U.S. Army Corps of Engineers Permit, a EPA NPDES permit, or a Massachusetts Wetlands or Waterways Order of Conditions or License. Application must be made to DEQE to certify that a proposed project will attain or maintain the Massachusetts Water Quality Standards and minimize adverse impacts to water quality.	Necessary applications will be filed with DEQE for any proposed activity that falls under this jurisdiction.

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*Applicability pending Massachusetts DEQE determination.

POTENTIAL ACTION-SPECIFIC ARARs

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

POTENTIAL ARAR	REQUIREMENTS SUMMARY FOR FFS
RCRA Hazardous Waste Facility Management Regulations (40 CFR 260 through 268)	If a facility operated pursuant to RCRA regulations, RCRA requirements are applicable. If contaminated substances at CERCLA sites are determined to be sufficiently similar to RCRA hazardous wastes, technical aspects of RCRA requirements are considered relevant and appropriate. If removed from their existing location, hazardous substances should be handled, transported, and treated as RCRA hazardous waste. Remedial alternatives such as capping or incineration should be conducted consistent with RCRA landfill closure and RCRA incinerator requirements.
Clean Air Act (CAA) Regulations, NAAQs for Particulates (40 CFR 50)	Site remediation activities, including excavation and treatment, must comply with NAAQS. The most relevant pollutant standard at remedial response sites is for particulate matter.
OSHA General Industry Standards, Recordkeeping and Reporting, and Standards for Hazardous Waste Site Operations 1926, 1904, 1910 (29 CFR)	These standards specify the type of safety equipment and other worker safety procedures to be followed during all remedial activities.
Massachusetts Hazardous Waste Management Rules (MHWMR) (310 CMR 30.00)	Massachusetts is authorized by EPA to administer the federal RCRA program (up to the HSWA amendments). If a facility operated pursuant to RCRA regulations, RCRA requirements are applicable. Similar to the RCRA regulations, these rules will be considered relevant and appropriate at CERCLA sites where the hazardous contaminants have been determined to be sufficiently similar to the designated hazardous wastes, and proposed remedial actions are similar to hazardous waste treatment, storage, and/or disposal.
Massachusetts Contingency Plan (MCP) (310 CMR 40.00)	The MCP establishes requirements and procedures for the discovery, notification, assessment of, and response to, releases and threats of release of oil or hazardous materials. Pursuant to MGL c21E and the MCP, the Commonwealth of Massachusetts publishes a list of confirmed oil or hazardous material to be investigated. Because the Baird & McGuire site is a confirmed state hazardous material site and listed on the National Priorities List, joint federal and state jurisdiction exists. Cooperative agreements and contracts with the federal government shall incorporate, to the extent possible, the deadlines and specifications of MGL c21E and the MCP.

TABLE 2-5
(continued)
POTENTIAL ACTION-SPECIFIC ARARs

COCHATO RIVER SEDIMENT STUDY
BAIRD & McGUIRE SITE
HOLBROOK, MASSACHUSETTS

POTENTIAL ARAR	REQUIREMENTS SUMMARY FOR FFS
Massachusetts Air Pollution Control Regulations (310 CMR 6.00 through 8.00)	These regulations outline the standards and requirements for air pollution control in Massachusetts. Specific regulations generally considered ARARs at CERCLA sites include the particulate matter standard (for excavation and treatment activities), and plan approval and emission limitations (for treatment activities, such as incineration, generating pollutant emissions).

TABLE 11
COMPARITIVE COST ESTIMATES FOR REMOVAL ALTERNATIVES
PUBLIC HEALTH RISK LEVELS - 1,500 CUBIC YARDS

COCHATO RIVER SEDIMENT FFS
BAIRD & MCGUIRE SITE
HOLBROOK, MASSACHUSETTS

ACTIVITY	R-1 COSTS ($)	R-1 TOTALS ($)	R-2 COSTS ($)	R-2 TOTALS ($)	R-3 COSTS ($)	R-3 TOTALS ($)
I. CONSTRUCTION COSTS						
A Site Preparation	$ 21,800		$ 21,800		$ 21,800	
B Sediment Excavation	25,000		27,000		32,600	
C Monitoring During Excavation	30,000		30,000		30,000	
D Sediment Dewatering	114,600		114,600		8,100	
E Water Treatment	219,500		155,800		141,000	
F Treatment and/or Disposal; Residuals Management, Mobilization (R-3 only)	561,900		512,900		1,156,900	
G Backfill Excavated Area	4,900		4,900		4,900	
H Road Closure	11,900		11,900		11,900	
TOTAL DIRECT COSTS		$ 989,600		$ 878,900		$1,407,200
I Health and Safety (10%)	98,960		87,890		140,720	
J Legal, Administration, and Permiting (5%)	49,480		43,945		70,360	
K Engineering (10%)	98,960		87,890		140,720	
TOTAL INDIRECT COSTS		247,400		219,725		351,800
SUBTOTAL		1,237,000		1,098,625		1,759,000
CONTINGENCY (20%)		247,400		219,725		351,800
TOTAL CONSTRUCTION COSTS		1,484,000		1,318,000		2,111,000
II ANNUAL OPERATING COSTS						
A Annual Monitoring	22,000		22,000		22,000	
TOTAL ANNUAL COSTS		22,000		22,000		22,000
PRESENT WORTH OF ANNUAL COSTS (30 YEARS)[1]		338,000		338,000		338,000
III TOTAL PRESENT WORTH		$1,822,000		$1,656,000		$2,449,000

NOTE: [1] Discount rate = 5%

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

BAIRD & McGUIRE SUPERFUND SITE/
COCHATO RIVER SEDIMENT STUDY AREA
HOLBROOK, MASSACHUSETTS

SEPTEMBER 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION I

BAIRD & McGUIRE SUPERFUND SITE
COCHATO RIVER SEDIMENT STUDY AREA
RESPONSIVENESS SUMMARY
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PREFACE

The U. S. Environmental Protection Agency (EPA) held a 30-day public comment period from June 19, 1989 through July 19, 1989 to provide an opportunity for interested parties to comment on the draft Focused Feasibility Study (FFS) and the June 1989 Proposed Plan prepared for the Baird & McGuire Superfund Site/Cochato River Sediment Study Area in Holbrook, Massachusetts. The draft FFS examines and evaluates various options, called remedial alternatives, to address sediment contamination in the Cochato River Sediment Study Area. EPA identified its preferred alternative for the cleanup of the contaminated sediments in the Proposed Plan issued on June 13, 1989, before the start of the public comment period.

To facilitate cleanup of the Site, EPA has divided its investigation of the Baird & McGuire Site into four segments, known as operable units. A Remedial Investigation (RI) and a Feasibility Study (FS) for the first two operable units (groundwater and on-Site soil contamination, respectively) was conducted between 1983 and 1986. EPA held a formal public comment period on its preferred alternatives for addressing these contaminated areas and, in 1986, signed a Record of Decision (ROD) that established EPA's plans for Site cleanup. Extraction and on-Site treatment were the technologies chosen by EPA to address groundwater; excavation and on-Site incineration were the approaches chosen to address soil contamination. The third operable unit for the Site focuses on Site-related contamination found in the Cochato River sediments. A fourth operable unit, scheduled for completion in 1990, will evaluate remedial alternatives to replace municipal water supplies lost as a result of Site-related contamination.

The purpose of this Responsiveness Summary is to document EPA responses to the questions and comments raised during the public comment period on the third operable unit, the Cochato River Sediment Study Area. EPA considered all of these questions and comments before selecting a final remedial alternative to address sediment contamination in the Cochato River Sediment Study Area of the Baird & McGuire Site.

This Responsiveness Summary is divided into the following sections:

I. Overview of Remedial Alternatives Considered in the Focused Feasibility Study, Including the Preferred Alternative - This section briefly outlines the remedial alternatives evaluated in the FFS and the Proposed Plan, including EPA's preferred alternative.

II. Background on Community Involvement and Concerns - This section provides a brief history of community interest and concerns regarding the Baird & McGuire Site.

III. Summary of Comments Received During the Public Comment Period and EPA Responses - This section summarizes and provides EPA responses to the oral and written comments received from the public during the public comment period.

IV. Remaining Concerns - This section describes issues that may continue to be of concern to the community during the design and implementation of EPA's selected remedy for the Baird & McGuire Site. EPA will address these concerns during the Remedial Design and Remedial Action (RD/RA) phase of the cleanup process.

In addition, two Attachments are included in this Responsiveness Summary. Attachment A provides a list of the community relations activities that EPA has conducted to date at the Baird & McGuire Site. Attachment B contains a copy of the transcript from the informal public hearing held on July 12, 1989.

I. OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FOCUSED FEASIBILITY STUDY, INCLUDING THE PREFERRED ALTERNATIVE

Using the information gathered during the Focused Feasibility Study (FFS), including the Risk Assessment (a study that assesses the potential risks to public health and the environment associated with Cochato River sediment and surface water contamination), EPA identified specific objectives for the cleanup of the Baird & McGuire Site/Cochato River Sediment Study Area. The response objectives are:

1. Reduce human exposure to contaminants in Cochato River sediments; and

2. Reduce environmental exposure to sediments in the Cochato river bed, the Ice Pond located north of the Site, and the Mary Lee Wetland area north of the Ice Pond.

Compounds for which specific cleanup goals have been set include: arsenic; the pesticides chlordane and DDT; and polynuclear aromatic hydrocarbons (PAHs), a group of compounds associated with burning of fossil fuels commonly found in urban areas.

EPA has screened and evaluated several potential cleanup alternatives for the Baird & McGuire Site/Cochato River Sediment Study Area. This evaluation, the FFS, describes alternatives for addressing remediation of contaminated sediment, as well as the screening criteria used to narrow the list to six potential remedial alternatives: three alternatives that would not require removal of contaminated sediments from the river area and three alternatives that would require sediment removal. Each of these alternatives is described briefly below. Additional information on each of the remedial alternatives can be found in the Record of Decision (ROD), copies of which are located in the Holbrook Public Library and the EPA Records Center at 90 Canal Street in Boston, Massachusetts.

Non-Removal (NR) Alternatives

- NR-1: No Action. Under this alternative, no treatment of contaminated sediments would be conducted. In addition, no institutional controls (such as fencing, warning signs, and deed restrictions) would be implemented to reduce the potential for exposure to contaminants. Site reviews would be conducted every five years to determine if risks to public health and the environment have changed.

- NR-2: Institutional Action. This alternative requires no treatment of contaminated sediments, although institutional controls would be used to reduce the potential for exposure to sediments. Site reviews would be conducted every five years.

- NR-3: In-Situ Containment. This alternative would entail construction of a multi-layer cap over the bottom of sections of the Cochato River and certain associated wetlands, to prevent contact with contaminated sediments. Construction and maintenance of the cap would require the construction of permanent roads adjacent to the river.

Removal (R) Alternatives

- R-1: Removal and Off-Site Disposal. This alternative would entail excavation of sediments from sections of the Cochato River and associated wetlands. Excavated sediments would be transported off-site to a federally-approved hazardous waste landfill.

- R-2: Removal and Incineration. Under this alternative, excavated contaminated sediments would be incinerated at a specially-designed hazardous waste incinerator that would be located on-Site as part of the overall cleanup of the Baird & McGuire Site.

  In the Proposed Plan issued prior to the public comment period, EPA recommended this alternative as its preferred remedy for addressing Cochato River sediment contamination at the Baird & McGuire Site.

- R-3: Removal and Solvent Extraction. This alternative would treat excavated sediments using a chemical process, called solvent extraction, that would separate the contaminants from the sediments. The concentrated contaminants would be destroyed by burning them in an incinerator that would be located on-Site as part of the overall cleanup of the Baird & McGuire Site.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Baird & McGuire Site is located on South Street in the town of Holbrook, Massachusetts, approximately 14 miles south of Boston. For over 70 years, Baird & McGuire, Inc. operated a chemical mixing and batching facility at the Site, formulating household and industrial products such as floor waxes, wood preservatives, pesticides and solvents. Widespread contamination by a variety of organic and inorganic chemicals, including dioxin, exists at the Site.

The Baird & McGuire property is approximately eight acres in size, and originally consisted of an office building, storage building, tank farm, laboratory building, and mixing building. The last three facilities were demolished by EPA during 1987 Initial Remedial Measures (IRM) which were conducted to address aspects of Site contamination prior to implementing long-term remedial measures. The 20-acre Superfund Site includes the 8-acre Baird & McGuire property, and is located approximately 1,500 feet away from the Holbrook South Street well field. The last operating well was closed in 1980 due to chemical contamination.

Approximately 2.5 miles downstream of the Site, the Cochato River flows past the Richardi Reservoir, which serves as a secondary surface water reservoir for the towns of Holbrook, Randolph, and Braintree, Massachusetts. Prior to a release of Site-related contamination into the river, water from the Cochato River was diverted into the Richardi Reservoir through surface water intakes. These intakes have been closed since March 1983.

The Baird & McGuire Site was added to the National Priorities List (NPL) in December 1982, making it eligible to receive federal funds for investigation and cleanup under the Superfund program. In 1983, EPA conducted a removal action after a waste lagoon overflowed into the Cochato River; a second removal action was conducted in 1985 when dioxin was discovered in Site soils. Further work was conducted at the Site during the 1987 IRM, including the removal of certain Site buildings and placement of a temporary synthetic cap over Site soils to prevent contact with contaminants.

Community concern surrounding contamination at the Baird & McGuire Site has been high since the early 1980s when drinking water well contamination in the vicinity of the Site was first detected. Regional media coverage of Site-related activities has been extensive. Community involvement heightened in early 1985 when a national environmental organization became active at the Site, and over 250 letters from residents expressing their concerns were received by EPA. In addition, a local citizens' group, People United to Restore the Environment (PURE), was formed at that time.

Following release of the 1985 RI, EPA held a public meeting to present the results of the RI on June 10, 1985. Over 200 people attended the meeting and presented a petition containing over 1,000 signatures. Principal concerns expressed in the petition included requests for fencing of the Site; a comprehensive health study; removal of Site buildings; diversion of the town water main passing through the Site; testing of Cochato River water quality; a meeting with the EPA Regional Administrator; and citizen involvement in the development of Site cleanup plans.

EPA promised to respond to these requests, and also invited citizens and officials to establish an informal citizens advisory committee to work with the Agency. This committee, known as the Baird & McGuire Task Force, was organized soon afterwards with broad representation from both residents and local officials. EPA has met and continues to meet regularly with the Task Force to present Site information and discuss issues of concern to the community.

Public interest increased again in July 1985, when EPA discovered low levels of dioxin in Site soils. EPA and the Massachusetts Department of Environmental Protection (DEP), formerly the Massachusetts Department of Environmental Quality Engineering, subsequently held a briefing for officials and citizens on the implications of this discovery and the steps EPA would take to address potential risks associated with the discovery of dioxin. This briefing and subsequent Site-related events received extensive media coverage.

Public involvement in the Superfund process has continued at a high level throughout the various steps in the remedial process, and the EPA continues to meet on a regular basis with the Baird & McGuire Task Force. A public meeting held in June 1989 on the Cochato River Sediment Study Area FFS and the Proposed Plan was attended by approximately 30 residents, and included a presentation by the Task Force. The principal community concerns expressed at that time are broadly summarized below.

- On-Site Incineration. Residents expressed concern about the safety of operating an incinerator on the Site. Residents also requested information on possible locations of the incinerator and on EPA's plans for incinerator ash disposal.

- Wetlands. Residents and officials expressed a strong interest in being involved in the remedial design phase of the Cochato River cleanup, and stressed their concerns about potential impacts on wetlands along the river.

- Drinking Water Quality. Residents stated that they wished to be involved in the decision-making process regarding future use of the Cochato River as a drinking water source. Residents stated that the practice of diverting the Cochato River into the Richardi Reservoir should not be renewed.

III. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

This Responsiveness Summary addresses the comments received by EPA concerning the FFS and Proposed Plan for the Cochato River Sediment Study Area of the Baird & McGuire Superfund Site in Holbrook, Massachusetts. Five sets of written comments were received during the public comment period (June 19 - July 19, 1989). Six oral comments were presented at the July 12, 1989 informal public hearing held in Holbrook. One of these comments was reiterated in writing in a letter received by EPA during the public comment period. All of the commenters were local citizens, including one representative of the Baird & McGuire Task Force and the Holbrook Conservation Commission. A copy of the transcript of the hearing held on July 12, 1989 is included as Attachment B. Copies are also available at the Holbrook Public Library, the information repository that EPA has established for the Site; and at the EPA Records Center at 90 Canal Street, Boston, Massachusetts, 02114 as a part of EPA's Administrative Record.

The comments from citizens, along with EPA responses, are summarized and organized into the following categories:

A. Comments Regarding Incineration;
B. Comments Regarding Sediment Excavation;
C. Comments Regarding Health Concerns; and
D. General Comments.

A. Comments Regarding Incineration

1. Two commenters requested that EPA inform the Town of Holbrook about the results of the test burn as quickly as possible. One commenter requested that EPA conduct a public meeting to discuss the test burn results.

EPA's Response 1:

EPA is currently conducting a "test burn" on soil from the Baird & McGuire Site at EPA's Office of Research and

Development facility located in Arkansas. The test burn is scheduled to be completed in September 1989, with results becoming available approximately 2 months later. The test burn will provide information regarding optimum operating conditions for the incinerator, and characterization of the waste streams generated by the incineration process for proper handling. The test will also determine the fate of arsenic, a metal that is not destroyed by the incineration process, in the treated soil.

As soon as the information becomes available, EPA will provide the information to interested citizens. The information will also be placed in the local information repository located at the Holbrook Town Library.

For the past several years, EPA has regularly attended the Baird & McGuire Task Force meetings that are held evenings at the Holbrook Town Hall on an as-needed basis. These meetings, which are open to the public, have been found to be an effective forum for providing information to the community and for discussion purposes, and the Task Force members are familiar with the Site and its history. Although EPA does not envision holding a separate formal EPA public meeting regarding the test burn results, EPA will continue to attend the Task Force meetings as a means of information dissemination to the community, in addition to keeping the local information repository current.

2. One commenter requested that EPA provide additional information about the noise generated by the incinerator.

EPA's Response 2:

EPA is aware of the desirability of minimizing impacts, such as noise, from remedial activities. However, any construction activities will inherently be disruptive to some degree. The design and subsequent construction will attempt to minimize the short term impacts to reach the long term goal of overall protection of public health and the environment. Although the implementation of a permanent remedy will have greater short term impacts than a "no action" or minimal action alternative, the fact that contaminants will no longer be able to migrate further downstream following completion of a permanent remedy must be considered.

Any remedial activity will generate some degree of noise. However, variables such as hours of operation for particularly noisy activities may be limited to certain times of the day. Techniques to minimize noise and other specific concerns will be examined during the remedial design process. However, it is impossible for the Agency to predict the noise level that will be generated by the incinerator, since the specific piece of equipment has not yet been selected for the project.

Once the design process is completed, the contract for conducting the soil and Cochato River sediment incineration will go out for bid. Once all of the bids are evaluated, the contract will be awarded. It will then be the responsibility of the contractor that is selected to bring an incinerator on-Site to treat the contaminated soils and sediments. The contractor will be required to conduct a "trial burn" on-Site to confirm that the equipment is capable of meeting the performance standard of decontaminating the soils and sediments and meeting all air pollution control requirements. Only after this capability has been demonstrated will the contractor be given approval to proceed with incinerating the (remaining) soils and sediments.

3. Five commenters asked EPA to provide information about the types of chemicals emitted from the incinerator stack, and two commenters specifically asked to be referred to studies about chemical output from hazardous waste incinerators and health problems related to incineration. The commenters asked EPA to provide the public with stack and air quality test results.

EPA's Response 3:

The fundamental concept of incineration is the utilization of extreme heat to volatilize and destroy organic compounds. An afterburner on the incineration unit is used to destroy the volatilized contaminants. The ash (decontaminated soil) is tested to ensure that the material no longer meets the definition of a hazardous waste.

The Resource Conservation and Recovery Act (RCRA) incineration standards, which the incinerator at the Baird & McGuire Site will be required to follow, specify three major requirements regarding incinerator performance:

a. The principal organic hazardous constituents (POHCs) must be destroyed and/or removed to an efficiency of 99.99%. POHCs are hazardous organic substances present in the waste which are representative of those constituents most difficult to burn and most abundant in the waste. The incinerator's performance in treating POHCs is considered indicative of overall performance in treating other wastes.

b. The particulate emissions must not exceed 180 milligrams per dry standard cubic meter, corrected to 7% oxygen in the stack gas. Compliance with the performance standard for control of particulate emissions is documented by measuring the particulate load in the stack gas during the trial burn.

c. Gaseous hydrogen chloride (HCl) emissions must be reduced either to 1.8 kilograms per hour or at a removal efficiency of 99%. Compliance with the performance standard for control of gaseous HCl emission is documented during the trial burn by measuring HCl in the stack gas.

There will also be requirements for waste analysis (before and after treatment), operation of the incinerator, monitoring, and inspections.

Two published technical articles on incineration of contaminated soils are included in the Administrative Record for this Site. These articles describe the results of process and emissions sampling and analysis.[1,2]

a. The first article, "Incineration of a Chemically Contaminated Synthetic Soil Matrix (SSM) Using a Pilot-Scale Rotary Kiln System," describes the results of two tests conducted on soils containing a range of concentrations of contaminants typical of those found at Superfund sites. A complete series of pilot-scale test burns was conducted and a battery of process and emission samples were collected and analyzed. The results from two tests indicate that the ash (treated soil) produced by incineration met proposed regulatory limits for all organics and metals, whereas the untreated soil exceeded the regulatory limits for organics.

b. The second article, "ENSCO MWP-2000 Transportable Incinerator," describes the results of several tests using three full-scale mobile rotary kiln incinerators. The first trial burns were compliance tests for a State of Florida air permit. The kiln was tested at a feed rate of 9,600 pounds per hour of solids over a wide range of operating conditions. Combustion efficiency

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[1] Esposito, M.P., M.L. Taylor, C.L. Bruffey, and R.C. Thurnau; "Incineration of a Chemically Contaminated Synthetic Soil Matrix (SSM) Using a Pilot-Scale Rotary Kiln System," 1988.

[2] Lanier, J.H.; "ENSCO MWP-2000 Transportable Incinerator," 1988.

was consistently above 99.9%, and particulate emission levels were less than one-half of the regulatory (RCRA) standard. The second set of three trial burns included PCB-contaminated soils and liquid PCBs. Destruction and removal efficiencies (DREs) were consistently higher than the Toxic Substances Control Act (TSCA) requirement of 99.9999%. Particulate loading was approximately one-quarter to one-half of the RCRA standard. The third set of trial burns was conducted at a site in Mississippi with dioxin-contaminated soil. The dioxin surrogates hexachloroethane and trichlorobenzene showed DREs greater than 99.9999%, the RCRA standard for dioxin. The particulate emission levels were less than one-half the RCRA standard.

A third article, "Assessing the Risks of Incinerating Dioxin-Contaminated Soil," published in the July-August 1989 edition of Hazardous Materials Control, is also included in the Administrative Record. This article describes the calculation of emission rates, air quality modelling, exposure assessment, and risk characterization in the vicinity of incinerators operating at dioxin-contaminated sites. The excess lifetime cancer risk predicted is several orders of magnitude below the levels considered to be of concern by EPA.

It should be noted that incineration of municipal solid waste (MSW) is a different process than high temperature incineration of soils. Although dioxins are sometimes generated in low levels by MSW incinerators, dioxins have not generally been reported from testing of hazardous waste and PCB incinerators. There are several reasons why dioxins are not usually detected in hazardous waste incinerators, such as the one that has been selected in this remedy for the Baird & McGuire Site soil and sediment.

a. Hazardous waste incinerators are designed to optimize mixing of the waste material with combustion air. Oxygen is required to destroy organics. When sufficient oxygen is not available, organics may only be partially destroyed, resulting in emissions of compounds such as dioxins. Hazardous waste incinerators are operated with excess oxygen and are designed to maximize the mixing of oxygen with the waste gases. This design ensures efficient combustion and reduces the likelihood that dioxins will be generated.

b. Hazardous waste incinerators are designed with long gaseous residence times. When compounds are volatilized (evaporated) from the soil, the resulting gas is mixed with oxygen at high temperatures to oxidize the organics. Hazardous waste incinerators are designed to have at least two seconds of mixing time for the gases at extremely high temperatures. This residence time is sufficient to minimize the amount of uncombusted organics released in the incinerator emissions.

c. Hazardous waste incinerators are designed to operate at high temperatures. In addition to the long residence times for the gases, incinerators are also designed to operate at high temperatures in the primary combustion zone. Gases are exposed to temperatures in excess of 2,000°F for two seconds in PCB incinerators. These high temperatures, combined with good mixing and sufficient residence time in the primary combustion chamber, destroy any organics in the incinerator emissions. The sophisticated design considerations employed for hazardous waste incinerators minimize the possibility of emissions not meeting all of the regulatory standards.

Test burn results and final plans and specifications developed during the design phase, as well as results of sampling during actual incinerator operation, are public information. EPA will share this information with the public as it becomes available. EPA will provide this information to the local information repository at the Holbrook Town Library, as well as present the findings to the Baird & McGuire Task Force which has been the major vehicle for community involvement over the past several years.

4. One commenter asked where else the particular type of incinerator proposed for use at the Site has been used.

EPA's Response 4:

EPA's preferred alternative calls for use of a rotary kiln incinerator for treatment of the contaminated sediments. A rotary kiln unit was recommended because the preliminary design of the incinerator for the Site soil incineration has found that a rotary kiln may be the most applicable to the Baird & McGuire Site.

There are several types of incinerators, including circulating or fluidized beds and infrared units. However, these types of units generally require a smaller size feed, (1 to 2 inches in diameter), as opposed to approximately 4 inches for a rotary kiln. Because of the nature of the contaminated Site soil and sediment, EPA believes that calling for a larger feed diameter may help alleviate some of the materials handling problems that may be encountered by the other types of units.

Incineration has been used at several hazardous waste sites nationwide. A transportable rotary kiln was used at the Nyanza Site in Ashland, Massachusetts; the Naval Construction Battalion Center in Gulfport, Mississippi; and the Times Beach dioxin Site in Times Beach, Missouri. Other sites that have used incineration include: the Arco Swanson River oil fields in the Kenai Wildlife Refuge, Kenai Peninsula, Alaska; Tillie Lewis Food Cannery Site in Stockton, California; the Cornhusker Army Ammunition Plant in Grand Island, Nebraska; the Louisiana Army Ammunition Plant in Shreveport, Louisiana.

5. One commenter asked how long the incinerator would be used at the Site, and expressed concern that toxic waste from other areas would be brought to Holbrook and incinerated.

EPA's Response 5:

It is impossible to predict the length of time the incinerator will need to be on-Site, since the specific equipment with its particular feed rate has not yet been selected. The larger the unit and therefore the greater the feed rate, the less time it will take for the contaminated soils and sediments to be treated. It should be noted that the incineration of approximately 1,500 cubic yards of sediments called for in this Record of Decision is only a small percentage (approximately 1%) of the overall soil incineration project.

The design and subsequent contract for the incineration will explicitly be only for the on-Site contaminated soils and sediments attributable to the Baird & McGuire Site. Wastes from other locations will not be shipped to the Site for treatment.

6. One commenter asked EPA to provide information about the composition of incinerator ash, as well as information about plans for on-Site ash storage.

EPA's Response 6:

A major reason for conducting the test burn at EPA's Office of Research and Development facility is to characterize the incinerator ash (treated soil). Since portions of the Site contain elevated levels of metals which are not destroyed by the incineration process, extensive sampling will be conducted to determine the levels of contaminants and how they behave both before and after treatment. For instance, if the mobility of the metals is increased such that the material fails the leaching test (used to determine whether or not a material is considered to be a hazardous waste under RCRA), additional treatment (such as solidification) may be required for the treated soil. The tests currently being conducted at EPA's research laboratory will determine whether or not any further treatment is needed, and the results of these tests will be made available to the public as soon as they are available.

It is assumed that the treated soil and sediment will no longer be considered a hazardous waste under RCRA, and this treated material will be used to backfill the Site where the contaminated soils are excavated. This assumption will be verified by the test burn results, as well as by confirmatory sampling that will be required as the incineration process proceeds. The sediment that is excavated from the Cochato River for treatment will be placed on-Site with the other treated soils, and will not be used as backfill in the river.

B. Comments Regarding Sediment Excavation

7. Three commenters stated that EPA should use backfill in excavated river bank areas and other sediment removal areas to prevent the movement of contaminants and sediments downstream in the Cochato River and to prevent contaminated sediments from getting stirred up or dissolving in the River. Several commenters also requested that EPA use backfill to cap excavated areas.

EPA's Response 7:

EPA considered the advantages and disadvantages of capping those portions of the river where excavation will occur. In the original preferred alternative, no capping nor backfilling was included. However, upon further consideration, EPA has modified its preferred alternative and has included limited backfilling in this Record of Decision.

There were several reasons EPA did not include capping or backfilling in its original proposal. These include:

a. Excavation of contaminated sediments and adjacent Site soils removes the source of contamination to the sediments. Once the top 6 inches of river sediments are excavated, the area is expected to silt in quickly with the surrounding sediments.

b. The groundwater extraction and treatment system will capture the contaminated groundwater that flows toward the Cochato River. (Bids have been received and award of the construction contract is scheduled for September 25, 1989.) Additionally, groundwater flow constitutes less than 1% of the river flow.

c. Impermeable capping was not allowed as an alternative during the 1986 Record of Decision. Capping is a disruptive activity to the area, requiring permanent roads along the river banks for maintenance purposes, and making it difficult for the river channel to normalize. A permeable cap would not provide a barrier to the flow of groundwater.

However, EPA has found that backfilling the excavated area in the vicinity of the groundwater plume discharge to the river will not be detrimental, and has decided to include this limited backfill as part of the selected remedy. Approximately 200 cubic yards of clean backfill material will be placed in excavated areas of the river in the vicinity of the groundwater plume discharge to the river.

8. One commenter stressed the importance of ensuring that none of the river banks are damaged or disturbed during the cleanup.

EPA's Response 8:

As stated in Response 2, remedial activities are necessarily disruptive to some degree. However, the design process will examine ways of minimizing damage to the adjacent river banks during construction.

As is shown in the FFS, an excavation access road will need to be constructed along one side of the river to reach the remediation areas. A portion of this access road is in the industrial area on the eastern side of the Cochato River, an area that is already developed. Another portion of the access road is within the Baird & McGuire property. Excavation access roads will utilize existing secondary roads to the extent possible. However, the limited areas that will be developed for new excavation access roads will be restored once construction is complete.

9. Two commenters requested that EPA install a monitoring system to detect the downstream movement of sediments and the presence of dissolved contaminants in water.

EPA's Response 9:

The remedial design will include provisions for monitoring the surface water of the Cochato River when excavation is conducted. Excavation will be conducted with a mechanical excavator, and operations will attempt to minimize sediment resuspension. In addition, silt curtains (barriers to prevent downstream migration of sediments) will be utilized in several locations throughout the excavation area to minimize any potential downstream transport of sediments.

With regard to dissolved contaminants, no Site-related organic nor inorganic contaminants of concern were detected in the surface water sampling that was conducted as a part of the FFS. Based on the observed concentrations of organic contaminants in sediments and their associated distribution coefficients, the total concentration of dissolved organic contaminants that may exist in solution during dredging is estimated to be less than approximately 2 micrograms per liter (ug/l or ppb). This dissolved concentration is calculated assuming conservative sediment concentrations and that maximum concentrations of contaminants of concern are co-located, which they are not. Calculated concentrations of individual contaminants of concern ranged from 0.45 ug/l for chlordane to approximately 1.1 ug/l for DDT and metabolites. There are no Maximum Contaminant Levels (MCLs) for any of these contaminants of concern. The calculated concentrations are less than or equal to the acute U.S. EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life. These calculations are included in the Administrative Record.

The inorganic contaminant of concern, arsenic, was not detected in December 1987 or April 1988 surface water sampling of the Cochato River. The environmental fate of arsenic is described in the "Technical Memorandum: Summary of 1988 Sediment and Water Sampling Program" included located in the Administrative Record. The discussion on the fate of arsenic is summarized below.

Arsenic is considered to be mobile in the environment and capable of cycling through the atmosphere, water, sediments, and biota by several mechanisms. Arsenic can be stable in natural waters in four oxidation states, but generally occurs either as arsenate (+5), arsenite (+3), or in methylated species. Arsenate predominates in most natural surface waters, but arsenite is more likely to predominate in mildly reducing conditions.

Sorption and desorption of arsenic to sediments dominate the cycling of arsenic in the environment. Sorption to or co-precipitation with hydrous oxides of iron is the major process in the removal of dissolved arsenic. Conversely, reducing conditions which convert iron (+3) to iron (+2) may indirectly increase arsenic by dissolution of hydrous iron oxides to which arsenic is bound. Arsenate ions are readily fixed by clay and humic content of soils, and by iron and aluminum oxides. Adsorption is most important in aerobic, acidic, freshwater conditions such as those likely to exist in the Cochato River. Arsenic is less likely to be adsorbed and more likely to remain dissolved as conditions become increasingly reducing, alkaline, or saline.

The adsorption of arsenic to sediment is not an entirely reversible process and the sediment usually acts as a sink for arsenic. Available information indicates that the distribution coefficient for soil desorption is significantly greater than that expected if only adsorption were involved, and is a function of soil chemical composition, including soil pH and iron oxide concentration.

Calculations of dissolved arsenic concentrations in the portion of the Cochato River being remediated were estimated using a range of desorption partition coefficients and average sediment arsenic concentrations; these are included in Administrative Record. These calculations indicate that dissolved arsenic concentrations will be less than the MCL of 0.050 mg/l and the acute freshwater AWQC for protection of aquatic life of 0.36 mg/l. Calculations using one half of the maximum arsenic concentration detected in the remediation area indicate that dissolved arsenic concentrations may exceed the MCL and AWQC values when the area of maximum arsenic concentration is excavated. These exceedances should be transient and will be mitigated by reabsorption and dilution.

10. The Massachusetts Department of Environmental Protection (DEP) stated that it concurs with the choice of remedial action selected for the Cochato River Sediment portion of the Baird & McGuire Superfund Site. The DEP expressed concern that EPA has not considered environmental effects resulting from the use of silt curtains during sediment removal activities, and requested that EPA provide additional information regarding how well the proposed curtains will minimize downstream impacts during dredging.

EPA's Response 10:

Silt curtains are a construction technique used to help minimize sediment transport. However, there is little specific information on the use of silt curtains in river settings. Silt curtains are not recommended for use in current velocities greater than 1.6 feet per second, in areas with high winds and large breaking waves, or in situations where frequent curtain movement is required. None of these conditions exist in the Cochato River.

The Army Corps of Engineers (COE) concluded that silt curtains were an appropriate sediment control technique for use in the upper New Bedford Harbor. The COE found an anchored filter-fabric silt curtain to be effective in minimizing sediment transport during pilot dredging in the harbor. COE information on silt curtains for turbidity control and a design schematic for silt curtain deployment in New Bedford Harbor are available in the Administrative Record. Suspended sediment controls will be considered during the design phase for this operable unit, and additional or alternative techniques will be examined and deployed, as appropriate.

The silt curtains will be removed at the completion of excavation activities, and any captured sediment will be incinerated with the other excavated sediments. Additionally, monitoring will be conducted during excavation activities.

11. One commenter noted that high levels of contamination are present in wetlands, and requested that EPA maintain ongoing communication with the Holbrook Conservation Commission and notify the Commission before conducting any activity that might affect the wetlands area.

EPA's Response 11:

The major mechanism by which EPA keeps local officials and interested citizens informed of Site activities is through the periodic Task Force meetings that are held in Holbrook. A member of the Holbrook Conservation Commission attends these meetings on a regular basis, and all interested parties are encouraged to attend.

In addition, EPA periodically conducts public meetings and mails fact sheets and/or Site updates to interested citizens. The Holbrook Conservation Commission is on the EPA mailing list for the Baird & McGuire Site, and will continue to receive information updates from the Agency regarding Site activities.

12. The same commenter asked EPA to explain what activities would be conducted in wetland areas and when these activities would take place.

EPA's Response 12:

This Record of Decision explains the activities that are planned for the Cochato River portion of Site activities. The remedial design process will provide much greater detail on activities that will impact wetland areas.

Generally, any necessary clearing and grubbing for the excavation access roads will be conducted along one side of the river. Upon completion of sediment excavation, these temporary access roads will be closed and the area will be regraded to approximate the original contours. Revegetation of these areas may also be warranted.

Please see Response 21 for a discussion of when Site activities may occur.

C. Comments Regarding Health Concerns

13. One commenter stated that there have been five cancer cases in the neighborhood bordering the Site and requested that EPA provide information about health problems that may result from air pollution and water contamination at the Site.

EPA's Response 13:

The only information that the EPA is aware of regarding health effects are two epidemiologic reports that cover the Town of Holbrook. These two reports are included in the Administrative Record for the Site.

a. The first report, "Epidemiologic Analysis: Holbrook," analyzed cancer mortality data for the 15-year period from 1969 to 1983. During the first two five-year periods, there were no statistically significant elevations in cancer mortality. For the third five-year period, the "all cancers" mortality rate was not significantly elevated, but statistically significant elevations were evident in males for both cancer of the bronchus and lung and bladder cancer, as well as other female organs. The primary risk factor for cancer of the bronchus and lung is cigarette smoking, but possible occupational exposures would also need to evaluated. In the other elevations, the number of cases is small and it is unlikely that an environmental association could be made.

Available cancer incidence data from 1982 and 1983 reveal that no significant elevation exists in any type of cancer in Holbrook. Although the cancer incidence rates for the Town of Holbrook as a whole were not significantly elevated, further analysis of residential data was conducted. The place of residence for all of the incident cases were plotted. The geographic location of these cases appears to be evenly distributed throughout the Town of Holbrook, which does not suggest an association with the Baird & McGuire Site.

b. The second report, "An Epidemiologic Investigation of Adverse Birth Outcome Data for Holbrook and Surrounding Communities: 1980 - 1984," examined adverse pregnancy outcome data for Holbrook and the six communities surrounding Holbrook: Abington, Avon, Braintree, Brockton, Randolf, and Weymouth. The investigation was undertaken in response to concern over contamination at the Baird & McGuire Site.

Adverse pregnancy outcomes, including congenital anomalies, fetal deaths, neonatal deaths, infant deaths, and low birth weights were examined for the period 1980 - 1984. No statistically significant elevations in the rate of adverse pregnancy outcomes were observed for Holbrook. A plot of fetal, neonatal, and infant deaths did not reveal any unusual geographic clustering surrounding the Baird & McGuire Site. No time-related clustering of adverse pregnancy outcomes was found.

Additionally, a Health Assessment is currently underway for the Site, which is being conducted by the Massachusetts Depart of Public Health (DPH), on behalf of the Agency for Toxic Substances and Disease Registry (ATSDR). This Assessment will update the information in the two reports listed above, as well as examine the need for a health study. Once this Health Assessment is completed, it will be made available to the public.

14. One commenter stated that the Baird & McGuire Site is directly responsible for the sickness and deaths of residents bordering the Site.

EPA's Response 14:

Please see Response 13 for information regarding the epidemiologic investigations that have been conducted to date for the Town of Holbrook.

15. One commenter expressed concern about the health effects that have resulted from Site contamination, and asked that "no further harm" be caused by cleanup methods used at the Site.

EPA's Response 15:

Remediation will be conducted in a manner that minimizes impacts to surrounding areas. Air monitoring will be required to ensure that allowable levels of contaminants are not exceeded. Potential techniques to minimize air releases include the use of sophisticated air pollution control devices on the incinerator (stack), and limiting the extent of excavation at any one time, particularly for the on-Site soil excavation portion of the remedial activity. Excavation activities will be controlled so that releases of soils will not occur. Work areas will be designated as either contaminated, a decontamination zone, or as clean unrestricted areas. Site activities will be conducted such that these designations are maintained.

16. DEP stressed that, to achieve a permanent solution, the remedial action must reduce significant risk to below a 1 in 100,000 (10^{-5}) risk of cancer, and reduce contaminant levels to an estimated daily dose equal to 20 percent of the acceptable intake of the contaminants.

EPA's Response 16:

All 102 contaminants originally evaluated in the Baseline Risk Assessment for the Site were re-evaluated during the selection of contaminants of concern for the Cochato River FFS. The levels of arsenic, DDT, chlordane, and carcinogenic PAHs at the Site were associated with elevated carcinogenic public health risks.

The remedial action called for in this Record of Decision will reduce the Site risk to a 1 in 1,000,000 (10^{-6}) excess risk of cancer for three of the four contaminants of concern. The only contaminant of concern that will achieve the 10^{-5} risk level is PAHs, which are found widely throughout the Cochato River drainage basin. See Section X.A.1 of the ROD for further discussion.

It should be noted, however, that the 1986 ROD extent of on-Site excavation was influenced by the surrounding wetlands and concern for their impacts. The areal extent of excavation was scaled back such that remaining areas will approach the 10^{-4} risk level. Therefore, only until the excavation and confirmatory sampling is conducted will the Agency be able to document the level of cleanup that is actually achieved.

Noncarcinogenic compounds were also detected at the Site, but below concentrations considered to present a public health risk. Selected noncarcinogenic compounds were quantitatively evaluated during the selection of the contaminant of concern process. Exposure to lead via the ingestion of surface water was examined as a part of this process. The highest lead concentration detected in the unfiltered surface water of the Cochato River was 0.008 ppm (8 ppb). This value is below the MCL for lead of 0.050 ppm. Examination of historical data and additional sampling undertaken as a part of this FFS does not indicate the presence of lead in surface water in excess of appropriate health-based criteria. Since exposure to lead was not considered to present a public health risk, it was not evaluated further in the risk assessment.

17. One commenter stressed that EPA should "take the site cleanup seriously" and indicated his concern that EPA is evaluating cleanup options by focusing on costs instead of public health issues.

EPA's Response 17:

EPA has already committed extensive resources to the Baird & McGuire Site, and the Agency continues to do so. To address the public health issues, EPA has conducted a variety of activities, including: the installation of fencing, a groundwater recirculation system, and temporary capping; the demolition of two Site buildings and the tank farm; and the rerouting of a water main that used to pass through the Site. The remedy selected in this ROD calls for protection of public health through the excavation of contaminated sediments.

EPA's primary focus is to achieve adequate protection of public health and the environment. However, Congress also requires the EPA to select a cost-effective remedy. Therefore, the Agency must consider a number of factors in its assessment of alternatives for a given site. These factors are discussed more fully in the Record of Decision, particularly in Section XI.

D. General Comments

18. One commenter requested that Site activities be publicized more widely and requested more reporting and advertising in the Holbrook Sun and Brockton Enterprise. This commenter also requested specifically that future meetings be advertised on cable television.

EPA's Response 18:

The Holbrook Sun and the Brockton Enterprise are on EPA's mailing list for the Baird & McGuire Site, as are other local newspapers. EPA periodically issues press releases when major milestones are reached at the Site. In addition, the Baird & McGuire Task Force meetings are covered by the local cable television station.

The commenter may wish to contact the newspapers of interest directly to express their interest in continuing coverage of the Baird & McGuire Site activities.

19. One commenter stated that she would not support a cleanup plan that allows water flowing through the Site to be used as part of Holbrook's drinking water supply.

EPA's Response 19:

Prior to the release of contaminants into the Cochato River in 1983, the Cochato was diverted into the Richardi Reservoir approximately 2.5 miles downstream of the Site. Since the 1983 release, this diversion has been closed. Several rounds of surface water sampling conducted by EPA at various times have not indicated any detectable levels of Site-related contaminants.

Any decision on the use of the Cochato River for drinking water purposes rests with the local authorities and with DEP.

IV. REMAINING CONCERNS

Issues raised during the public comment period that will continue to be of concern as the Site moves into the RD/RA phase are described briefly below, along with EPA's responses. EPA will continue to address these issues as more information becomes available during the RD/RA.

20. One commenter requested that EPA establish a long-term environmental monitoring program at the Site to ensure that risks to the environment and public health are no longer present.

EPA's Response 20:

Monitoring will be included as a part of the remedial activities conducted at the Site. For example, as a part of the groundwater extraction and treatment system (first operable unit), monitoring of a series of wells surrounding the Site is included until the cleanup standards are attained for a period of time.

Additionally, for this operable unit, monitoring during excavation and long-term monitoring was added in response to public comments. Long-term monitoring will be conducted for the downstream portions of the Cochato River that will not have sediments excavated. Data will be collected and analyzed on an annual basis, and 5-year reviews will be conducted in accordance with the statute.

21. One commenter expressed concern about the possibility that the water treatment plant would be operating before the incinerator is brought on-Site. The commenter explained that this sequence would result in on-Site storage and dewatering of sediments prior to incineration.

EPA's Response 21:

There will be a number of remedial activities ongoing at the Site, and these activities will be integrated throughout the course of remediation of the Site. Remediation of Cochato River sediments will be scheduled after the groundwater treatment has begun, and so as not to interfere with on-Site actions.

Sediment remediation will rely to the extent practicable on facilities that will exist and operations that will be conducted on-Site. On-Site facilities that may be utilized include the groundwater treatment plant for treatment of dewatering effluent, the on-Site incinerator for sediment treatment, and the haul roads, decontamination facilities and soil staging area. Additional operations that are important for sediment remediation include the relocation of unnamed brook, clearing and grubbing, construction of temporary haul roads, and flood control measures.

Integration of the schedules of the sediment remediation and the other on-Site remediation activities is important for two reasons.

a. Timing of the sediment excavation relative to the initiation of other on-Site activities will impact the effectiveness of the sediment remediation.

   The organic-rich sediment in the Cochato River apparently serves as a filter for contaminants in groundwater, reducing concentrations as groundwater discharges to the river. Excavation of river sediment will not occur prior to the startup of the groundwater extraction and treatment system.

   The contract for the groundwater treatment system is pending award. Assuming an award date of fall 1989 with a one and one-half year construction period, the on-Site groundwater treatment would be operational in the spring of 1991. This allows time for the remedial design, contract bidding and award for the sediment remedial activities.

b. Sediment remediation activities will need to be undertaken to take advantage of facilities to be constructed or operations to be conducted as part of overall remediation activities.

   The schedule that is developed as the remedial design proceeds will attempt to factor in the timing of the various activities. In particular, the design of the on-Site incinerator is scheduled for completion in the summer of 1990, with contract bidding and award occurring subsequent to the completion of the design and the receipt of remedial action funding.

   Should the on-Site incinerator not be operational prior to excavation of the sediments, excavated sediments would be stockpiled on-Site in a secure manner until the treatment system was available.

ATTACHMENT A

COMMUNITY RELATIONS ACTIVITIES
CONDUCTED AT THE
BAIRD & McGUIRE SUPERFUND SITE

COMMUNITY RELATIONS ACTIVITIES
CONDUCTED AT THE BAIRD & McGUIRE SUPERFUND SITE

Community relations activities conducted at the Baird & McGuire Superfund Site include the following:

- March 1983 - EPA, DEQE and local officials met to discuss Superfund remedial action plans. This meeting resulted in mandatory cleanup and preventive measures being imposed on Baird & McGuire, Inc. by EPA and the Town of Holbrook.
- April 1983 - EPA released a preliminary site assessment.
- May 1983 - EPA released a Remedial Action Master Plan (RAMP), a work plan to address emergency conditions at the Site.
- May 1983 - EPA issued a Community Relations Plan for the Site.
- 1983 - Information repositories were established at the Holbrook, Braintree and Randolph Public Libraries.
- August 23, 1983 - EPA issued a press release announcing that an additional $165,000 in funding was approved to conduct cleanup and planning work at the Site.
- October 5, 1983 - EPA issued a press release stating that the Agency had filed suit against Baird & McGuire to recover past and future Site cleanup expenses.
- December 12, 1983 - EPA announced the approval of $295,000 in additional funds to conduct waste removal and grading activities at the Site. The funds would also be used to update hydrogeologic studies.
- April 20, 1984 - EPA issued a press release announcing the public availability a Remedial Investigation (RI) Work Plan which details studies to be conducted that would lead to the selection of a long-term remedy for the Site.
- May 1985 - EPA released a draft RI for the Site.
- June 1985 - EPA held a public meeting and accepted public comments on the RI. EPA also announced that a Phase II RI would be conducted.
- July 1985 - EPA assisted in the organization of the Baird & McGuire Task Force. This Task Force has continued to meet regularly to review technical documents and Site activities. In addition, the Task Force serves as a liaison between

concerned citizens and government agencies. EPA representatives have attended these meetings since the Task Force was first established.

- July 1985 - EPA issued a press release stating that low levels of dioxin had been detected in Site soils. The release further explained that EPA is working closely with the federal Centers for Disease Control, DEQE and the Massachusetts Department of Public Health to assess the public health impacts of these findings.

- 1985 - EPA announced that Initial Remedial Measures (IRM) conducted at the Site would include demolition of Site buildings, relocation of an on-Site water main and additional capping of soil "hot spots."

- August 15, 1985 - EPA announced the results of dioxin sampling from the Site. EPA solicited input from local officials and residents regarding sampling locations and incorporated local suggestions into the Agency's sampling plan.

- October 2, 1985 - EPA announced the results of pesticide, herbicide and dioxin sampling from Site soils.

- June 30, 1986 - EPA issued a press release announcing the completion of the Phase II RI. EPA also provided notification of an August public informational meeting and an August hearing to review the results of the RI. The release stated that copies of the RI are available for public review.

- July 22, 1986 - EPA issued a press release stating the availability of the final Feasibility Study (FS) for the Site.

- July 1986 - EPA sent copies of a fact sheet summarizing the RI/FS to concerned citizens and to the information repositories for the Site.

- August 6, 1986 - EPA issued a press release stating that the dates for the RI/FS public meeting and public hearing would be changed. The release stated that the public informational meeting would be held on August 20; the public hearing would be held on September 3; and the public comment period would take place between August 13 and September 8, 1986.

- August 20, 1986 - EPA held a public informational meeting to present the results of the RI/FS, and to discuss proposed cleanup plans for the Site.

- September 3, 1986 - EPA held an informal public hearing to provide an opportunity for public comment on the results of the RI/FS and the remedial alternatives that are being evaluated for the Site.

- September 30, 1986 - EPA signed a Record of Decision (ROD) outlining a phased remedial action plan for the Site.
- January 6, 1987 - EPA issued a press release announcing that EPA and the PRPs have signed a consent decree. A 30-day public comment period follows the signing of the consent decree.
- February 1987 - EPA allocates $500,000 for a new water main at the Site as part of the IRM initiated in 1985.
- May 1987 - EPA allocates funding for building demolition at the Site; demolition activities are initiated.
- July 1987 - EPA issued a revised Community Relations Plan for the Site.
- 1988 - Remedial design of the on-Site groundwater extraction and treatment system proceeds; various design documents are provided to the Task Force for review and comment. The Focused Feasibility Study (FFS) for the Cochato River Sediment Study Area continues; various technical memoranda are made available.
- June 1, 1989 - EPA issued a press release announcing that a public meeting would be held June 13 to discuss cleanup alternatives to address the Cochato River Sediment Study Area.
- June 1989 - EPA distributed a fact sheet summarizing the results of the FFS for the Cochato River Sediment Study Area and describing the Proposed Plan to address sediment contamination to concerned citizens and local officials in the Site area.
- June 13, 1989 - EPA held a public informational meeting to present the FFS report and Proposed Plan to address contamination in the Cochato River Sediment Study Area. EPA announced that a public hearing would take place on July 12 regarding the Proposed Plan, and a 30-day public comment period on the Proposed Plan would begin on June 19.
- July 12, 1989 - EPA held an informal public hearing to accept comments on the FFS and the Proposed Plan for the Sediment Study Area.

ATTACHMENT B

TRANSCRIPT FROM THE INFORMAL PUBLIC HEARING

UNITED STATES OF AMERICA

ENVIRONMENTAL PROTECTION AGENCY

REGION ONE

In the Matter of:

PROPOSED PHASE III CLEANUP PLAN FOR THE
BAIRD & MCGUIRE SITE/COCHATO RIVER SEDIMENT
STUDY AREA, PUBLIC HEARING

Wednesday
July 12, 1989

Holbrook High School
Franklin Street
Holbrook, Massachusetts

The above-entitled hearing was held pursuant to Notice, commencing at 7:45 p.m.

BEFORE:

RICHARD CAVAGNERO, Chairman
U.S. E.P.A.
Superfund Section

MARY SANDERSON
U.S. E.P.A.
Remedial Project Manager

PROCEEDINGS

[7:45 p.m.]

THE PRESIDING OFFICIAL: Good evening.

I guess we have everyone who is coming and we should be getting started.

My name is Richard Cavagnero. I work for EPA and the Chief of the Massachusetts Superfund Section, and I'm responsible for managing the site managers, like Mary Sanderson, who manage the Superfund sites within the State of Massachusetts. And I'm going to be the Chairman, I guess, of this meeting tonight.

And, again, I want to welcome you all. Thank you for coming.

The purpose of this hearing tonight is to accept comments on the remedial investigation and feasibility study and proposed plan for the remediation of a portion of the Baird & McGuire site, located here in Holbrook.

Specifically, what we are looking for comments is on the proposed plan for the remediation of the Cochato River sediments as opposed to other aspects of the cleanup which are ongoing, including the groundwater treatment, the incineration of soils, et cetera.

With me on my left, to your right, I guess, is Mary Sanderson, who is the site manager or remedial project manager for the site.

I'd first like to talk about the format for the hearing.

Mary will be giving you a brief overview of the proposed plan for the Cochato River sediment remediation.

As I hope many of you know, EPA was down here on June 13, along with our contractor, E. C. Jordan, and gave a fairly detailed presentation of this plan, along with some of the other alternatives that we looked at and held a question and answer period.

Mary is just going to recap that, will not be going into a great deal of detail.

There were handouts on your way in in the sign-up area, I guess. There is a one pager that had, I guess, the press release for the original public meeting. And there also was a copy of the proposed plan, 15 or 20 pages, I guess, which again outlines the alternatives we looked at and the one that we are recommending.

So, again, Mary will be giving a very brief overview. But the main purpose is then for us to take any oral comments you wish to make for the record.

I have been given a list people who signed up and indicated that they wished to make comments, and we'll be going through that, basically in the order we have them.

If, once we get through that, other people decide they want to make them, you're certainly welcome to do so. We just need to get your name so that we get the proper spelling for the transcript.

Once you make your comment, Mary or I or both may ask you some questions, just to make sure that we understand exactly what your comment is, because once we finish the hearing tonight, essentially we have to go back and write what's called the record of decision.

This is a document that will be signed by our boss, the Regional Administrator, and it will be the document that legally describes what the remedy will be for this portion of the site.

This will be based essentially on our proposed plan and any comments we received from the public, either that we receive at tonight's meeting orally or any written comments that you wish to submit.

The comment period did start on June 19th and will run through July 19th, which I believe is next Wednesday. So if you do wish to make any written comments, either instead of oral comments tonight or in addition to those, I would encourage you to do so. And we need to have you postmark them no later than July 19th and mail them to us.

The appropriate address is found on Page 2 of the proposed plan that, again, was available a month ago and also is available on the table in the sign-up area.

At the conclusion of the meeting, I would ask you to either check with myself or Mary if you have any questions about the process for making comments. We want to make sure that you fully understand what you need to do to get your comments on the record.

We will be preparing, as I said, the record of decision for the site. And as part of that record of decision, we'll prepare a document called the response of the summary, and essentially this is going to be a statement of all the comments that were made on the record, either orally or in writing, and our response, the agency's response to those comments.

Are there any questions on the format of the hearing before we start?

Okay.

With that, again, I would like to encourage you to make your comments tonight and/or get them to us in writing before July 19th.

And with that, I will turn it over to Mary Sanderson, who again will give you a brief overview of EPA's proposed plan.

I'd also like to mention, which I haven't already, we have with us Eric from APEX Reporting, who will be transcribing your comments, and he tells me you can make them from your seat and his mike will pick them up. So you simply stand or sit, if you want, and make them.

So with that, I would like to thank you and turn it over to Mary.

MARY SANDERSON: As Rich said, I won't go over the long version that I did a couple of weeks ago when we were down here. So I'll give you just a very brief recap about the site and about the focus of this evening's topics and comments.

We talked very briefly about the history of the site and operation of Baird & McGuire for over 70 years at the site and the other items that are going on in terms of the groundwater treatment plant, the soil incineration of the overall site soils and a separate water supply study that is also underway.

We then talked a little bit about the results of the feasibility study in terms of approximately 84 sediment samples that were taken, surface water samples and groundwater samples. And most contaminants are found approximately within 500 feet of the site.

We then spoke about the risk assessment portion of the study that the agency conducts and the potential risks, both to public health, assuming various exposures to the sediments in the river and potential environmental risks.

We then reviewed the feasibility study process that the agency goes through. The agency must balance nine criteria in selecting a remedy overall on a variety of items that we must examine.

On the basis of that criteria, we developed six alternatives, and those are given in much greater detail in your proposed plan.

There are three nonremoval alternatives I know. Action alternative and institutional action and then an in-place capping alternative.

And we also examined three removal alternatives that involve excavating sediments in the river and either solidifying them or incinerating them or just moving them off site for disposal.

Using those nine criteria that the agency must use, we then have selected a preferred alternative. And that's what we'd like to focus on a little bit here.

We have proposed the alternative of excavating the sediments within the vicinity of the site for protection of potential public health risks and the environmental risks in that area. That goes from the site approximately down to Union Street, about 500 feet down from the site. And we would incinerate those sediments, utilizing the incinerator that will be brought on the site for the incineration of the overall site soils.

There is more detail given in the proposed plan. There is a layout given on the layout of the haul roads, avoiding of the residential areas with any trucking of the materials and various silt cartons and such to minimize any impacts from that excavation.

We also have proposed not to remove any contaminated sediments further downstream, much lower levels of contaminants that would pose potential environmental risks, because of the disruption to the wetlands down there, and we have not seen any impacts.

So, therefore, in summary, to give a very long and colorful history of a site in a very brief way, for this part of the study, which I would like to try to focus our comments tonight on, is on this portion of the site.

The Cochato River sediments that have been impacted by the site, we're proposing to excavate the sediments in the vicinity of the site, utilizing the on-site incinerator that will be brought on for incineration of those sediments, and to not excavate the sediments further downstream at the lower levels of contaminants.

And we would welcome your comments on any of the alternatives, the preferred alternative, in particular, and that is it.

So I will turn it back to Rich, who will field questions -- comments from your folks, really.

We will not be responding to them formally. We'll be just simply accepting your comments, as Rich said, then asking any clarification questions if we have them. But we will not be responding to them here tonight.

I will be available afterwards. We both will, informally, once the hearing is concluded, to give you some responses and to talk with you later.

Thank you.

THE PRESIDING OFFICIAL: Thank you, Mary.

I will now start taking comments from the audience. And the first commentor on my list is Dr. Conrad Jankowski, a member of the Baird & McGuire

Task Force.

CONRAD JANKOWSKI: Thank you.

I'm representing the Task Force tonight. I'm the Vice-Chairman of the Task Force.

Our Chairman, Emmet Hayes is held up at the State House. They had a late session tonight and I don't think he'll be here. And there were several things he wanted me specifically to enter into the record.

Before I do that, though, I'd like to say that these are not critical comments. By and large, the Task Force has been very pleased with the responsiveness of the EPA and their cooperation in most of the suggestions that we've made.

Well, to start these off, one of our concerns, and this would be in the operational aspect of this, is when they actually get out there and dredge things, there's going to be activity on the banks and on contaminated soil. And on the record, we would like very much to be sure that none of the banks are broken down and run into the river. None of the soil on the Baird & McGuire site, as traffic goes up and down, ends up in the river.

And this was one of our concerns.

The second concern is, as we start stirring up the sediments on the bottom, there is a possibility that some material may solubilize, actually dissolve in the water. We want to be certain that there is going to be a monitoring system in place that will not only check for the possibility of sediments going downstream, but also to look at the possibility of dissolved materials, which couldn't be trapped by any of the booms or anything like that.

And then a third concern is there may be a possibility that the incinerator won't be up and running and the water treatment plant may be up and running when they're actually doing this, which means they would have to store the sediments and dewater then on site.

So, consequently, in the operational aspect of this, the Task Force would like to be certain that this is done in such a way that they won't increase our problem, rather than decreasing our problem.

And then I have one last comment. I'll put on a different hat. I'm on the Conservation Commission for the Holbrook Conservation Commission.

And the Conservation Commission knows that the EPA and their contractors are going to be working in wetlands, and these wetlands are very, very much contaminated. And, certainly, probably the experts, the wetland experts, and EPA are more cognizant of the damage that could be done than perhaps even the Holbrook Conservation Commission is. However, we would like to leave communications channels open in such a way that anything that impinges or affects the wetlands, we could be notified about before it happens and what will be done and when it will be happen.

Do you need any answers from me on any of these?

THE PRESIDING OFFICIAL: Very clear.

CONRAD JANKOWSKI: Okay. Thank you.

THE PRESIDING OFFICIAL: That was an excellent speech and I thank you for it.

Thank you.

The next commentor is Mike Levangie, who is also on the Task Force and also a Selectman from the Town of Randolph.

MICHAEL LEVANGIE: I'll be very brief.

I just wanted to concur with everything that Emmet had said through Conrad and I think that everything that we had brought up at the last meeting pretty much spelled out exactly what was said here earlier with Conrad.

The only thing that I had major problems with was the preferred alternative that the EPA has established, especially with regard to the Mary Lee Swamp [phonetic] in the Town of Randolph.

My major concern is that there, No. 1, are pollutants in that particular area, although it has been spelled out in the EPA report that the pollutants are such that they are not a danger to the public health. However, they are an environmental danger.

My concern centers primarily on the fact that we were not able to establish any kind of good, warm feeling that there would not be long-term effects, adverse environmental and/or health effects in that particular area.

So my main concern is that we take a serious look at that area, mainly because I think that we might be starting to look at what it costs to really clean up as opposed to just do the clean up. And my main concern is that we're probably starting to look at dollars as opposed to health, and that is a major concern to me.

I think that if there is to be no clean up in that particular area, that we should certainly set up some sort of a long-term monitoring service or something in some way that we are assured over the long haul that we have taken care of things that may be adverse to both the environment and/or the health.

Because that's, I think, the main drive in the focus that we want to be looking at as seeing to it that there is a total clean up.

Thank you.

THE PRESIDING OFFICIAL: Thank you.

Next we have Beatrice Taggart, President of the Holbrook Grove Association.

BEATRICE TAGGART: Good evening.

I would just like to introduce me to everyone before I said anything, if that's okay.

THE PRESIDING OFFICIAL: Okay. That's fine.

Then we'll have Andy Prasnal, another Task Force member from the Town of Holbrook.

ANDREW PRASNAL: Good evening.

I'm also in favor of the proposed EPA solution to the cleanup of the Cochato in the immediate area of the Baird & McGuire site with the following conditions.

I feel that we should have some further study and consideration on the use of back fill while the portion of the Cochato River is being cleaned for the use of using this back fill as a future recreation of the sediment that is now keeping a lot of the contaminants from being carried downstream.

Early on in this, there was a concern that removing portions of the banks of the river would disturb the sediment and, in fact, portions of the sediment are going to be removed during this process, and this is still a gray area as to whether or not capping is the scientific way to go, but certainly there was some feeling that a back fill replacement would certainly not harm the situation and actually create an additional safety factor, in terms of the river holding any kind of, let's say, future creation of a sediment to hold any processing of the contaminants from being swept down the Cochato during this process.

And this is actually -- the use of this back fill is actually going to be put in place for a future concern of ensuring that what we do now would be held for future years to come in terms of what we're doing for the cleanup.

The other point that's more important is, I think, portions of the incineration process and the need to communicate a little bit better to the Town of Holbrook.

Based on the test burn that is going to be occurring in the near future at your Alabama test site, we really do need to know the earliest possible results of that test burn, because that test burn will actually determine the extent, a lot of the timing, in which it will take to actually deal with the amount of sediment that we are going to process.

After that occurs, there are also other communication needs here. As a citizen of the Town of Holbrook, I think my concerns would be the noise of the incineration, the chemical output from the stacks of the incineration and some hard plan for monitoring the actual chemical output of this incinerator.

There will also be a certain composition of ash, will be rendered after this process, and I would like to know more about where this ash is going to be stored in a plan and a hard plan for the storage, even though at this point we're looking at some sort of capping proposal.

And I think that during this -- during this period of time, my hope is that we could have the continued open communication along the lines of this project and that we could actually see more citizens of the Town of Holbrook present at these future meetings. Because as we go down the line, it's going to be important to have everybody realizing what is happening and to have all the information and not hearsay and a rumor to run rampant in the town as to what, in fact, we are doing.

Those are the points that I wanted to make.

Thank you.

THE PRESIDING OFFICIAL: Thank you.

Well, Beatrice, I guess it's to you unless anyone else wants to make a comment. There were a few questions marks.

Other than Beatrice Taggart, would anyone else like to make a comment for the record?

Yes.

SALLY HERTZ: Sally Hertz. I'm a resident here in Holbrook.

And my main concern at this point is, just as this fellow said, the chemical output from this incineration, I read and heard talk of this incineration and that's our miracle cure.

But I'm not sure that I've heard an answer of what it is we're going to be putting into the air and what we're going to be breathing, and I'm uncomfortable with that. And I don't know whether I misunderstand it or whether there's something I can read to be assured.

It says here in this press release, incineration is a proven technology and has been used successfully for a number of years at hazardous waste sites.

How long has it been in use? What kind of studies do we have? People in the area know there was an unofficial study done at East Braintree and that there were -- from that study, there were higher skin diseases, respiratory diseases, for people in that neighborhood.

And that's really my main concern at this point, is what are we going to be putting in the air and where can I learn something on it to make me feel more comfortable that we're not just making it more poisonous?

THE PRESIDING OFFICIAL: Okay.

As Mary said, we're not really going to answer questions tonight.

We will get that into the record and include it, but I just did want to let you know that we did indicate at our last meeting here that, as the gentleman indicated, we are presently about to get ready to ship some soil out to -- where exactly is it? -- Arkansas -- thank you -- for a trial burn. And one of the purposes of this is, not only to set incinerator design parameters, but also to look at what is going to be in the ash or soil as it comes out, what is going to be in the air, what kind of, you know, gases and any other side streams, and we fully plan to, you know, come back to Holbrook once we've gotten all this information and digested it, so we can let you know that.

SALLY HERTZ: My other concern I have is, once this incinerator is in place, is this going to become a, quote, unquote, temporary permanent situation where we then start bringing in toxic waste from other areas to incinerate in Holbrook? An incineration plant?

UNIDENTIFIED MALE: Yes, we're available after ---

THE PRESIDING OFFICIAL: That's a no, though.

Yes, sir.

UNIDENTIFIED MALE: I live on Washington Circle. Put the sewer in and hit an underground stream and come up in a circle and flow into the swamp down below, was that water ever tested to see where it came from?

THE PRESIDING OFFICIAL: I'm not really sure.

If you could -- once we close this meeting tonight, if you want to come up and talk to Mary about it, she ---

UNIDENTIFIED MALE: Can't we have an answer to that, Tom?

THOMAS CUMMINGS: Yeah.

Basically the water that we get on Washington Circle is just basically groundwater and it's really, you know, downgraded from the site. So I don't see any -- you know, it is flowing on the roadway now, it's going into a stream that defers it, it goes into the Cochato, but the groundwater there, you know, appears we're just hitting the table and we're running into it.

THE PRESIDING OFFICIAL: Beatrice, did you say you wanted to make a statement?

BEATRICE TAGGART: Well, basically I'd like to reiterate what this lady said and the gentleman, what he said, as far as being very concerned about the gases that would be emitted in the ashes and that type of thing.

And I would like to ask, is there going to be another meeting after we have the results from the samples that you sent out?

THE PRESIDING OFFICIAL: Yes, we will have one. I can't give you the date now.

BEATRICE TAGGART: All right.

THE PRESIDING OFFICIAL: But definitely, we will have one.

Yes, ma'am.

JOAN IKASALO: I'm Joan Ikasalo. I live in Revere Acres and I've lived in Holbrook 36 years.

I'm just curious. Is there a reporter from the Holbrook Sun?

I just feel we just get such poor advertising, poor reporting in the Holbrook Sun, our own town paper. Like it comes out yesterday, there was an article, why not remind it to the people, last night. I don't see it in the Brockton Enterprise.

I mean, maybe it's in the Quincy Ledger. I don't know. But I get the Brockton, I get the Holbrook Sun and I don't feel there is enough advertising or reporting for important things like this, because other people in Holbrook should be here. But there really isn't good reporting.

THE PRESIDING OFFICIAL: So your request is that any future meetings of this type be advertised on cable TV?

Okay. We'll get that on the record.

Would anyone else like to make a statement?

Okay.

I'd like to, again, thank you all for coming out here again and remind you, again, that you can also make written comments, if you'd like, even if you've spoken tonight. And you need to send them to Mary's attention. The address is listed in the handout. And we need to get them postmarked by July 19th.

And with that, I guess we'll close the hearing, but we will be hanging around for a little while, if people want to come and ask us anything else while we're here.

Thank you very much.

[Whereupon, the hearing in the above-entitled matter was concluded.]

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings

before: Richard Cavagnero, Chairman

in the Matter of:

BAIRD & MCGUIRE SUPERFUND SITE

Place: Holbrook, Massachusetts

Date: July 12, 1989

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above titled proceeding.

Eric Pedersen
Reporter

7/18/89
Date

Norton Beecroft
Transcriber

7/18/89
Date

APPENDIX B

ADMINISTRATIVE RECORD INDEX

not included

APPENDIX C

STATE CONCURRENCE LETTER

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Bureau of Waste Site Cleanup
One Winter Street, Boston, Mass. 02108

Daniel S. Greenbaum
Commissioner

September 13, 1989

Paul Keough
Acting Regional Administrator
U.S. EPA
JFK Federal Building
Boston, Massachusetts 02203

RE: State Concurrence
with Record of
Decision for Baird
& McGuire Federal
Superfund Site/
Cochato River
Sediment Study
Operable Unit #3

Dear Mr. Keough:

The Department of Environmental Protection (The Department) has reviewed the preferred remedial action alternative recommended by the U.S. EPA for the Baird & McGuire Federal Superfund Site/Cochato River Sediment study in Holbrook, Massachusetts. The Department concurs with the choice of remediation selected for this portion of the Baird & McGuire site.

The Department has evaluated EPA's preferred alternative for consistency with the Massachusetts General Law Chapter 21E as amended in 1986 and the Massachusetts Contingency Plan (MCP). The preferred alternative addresses the contaminated Cochato River sediments for the third operable unit of the Baird & McGuire site. The remedial action comprises the following components:

1.) Removing contaminated sediments from the Cochato River;
2.) Incinerating the sediments in an on-site incinerator to destroy the contaminants.

The EPA states that for this operable unit, the remedial action will reduce the excess cancer risk to a 1 in 1,000,000 (10^{-6}), attributable to this disposal site. This is consistent with the overall permanency requirements of MGL Chapter 21E as defined in the MCP. The EPA has, however, stipulated that excavation and confirmatory sampling are required to document the level of cleanup

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which is actually achieved. If a permanent solution cannot be attained, a temporary solution will be proposed which eliminates significant risk to public health and the environment, and a plan to develop a permanent solution would then be required.

The total site cancer risk following the completion of all operable unit remedial actions may not exceed a significant risk level of $1x10^{-5}$ during any foreseeable period of time for the preferred alternative to be considered a permanent solution.

During the last operable unit for this disposal site, the Department will evaluate whether or not all remedial actions will reduce significant residual site risk for any foreseeable period of time, and if a permanent solution will be achieved.

The proposed remedy appears to meet all ARARs. The Department will continue to evaluate the ARARs as remedial design progresses and during implementation and operation of the remedy.

The Department looks forward to working with you in implementing the preferred alternative. If you have any questions, please contact Evelyn Tapani at 556-1125.

Very truly yours,

Daniel S. Greenbaum,
Commissioner
Department of Environmental
Protection

ET/tlt:sc

cc: Edward Kunce, RD
Richard Chalpin, DREE